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JANUARY 1988

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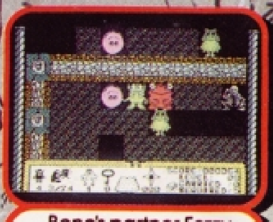
Bono takes the skeletons to a cauldron



Bono's partner Fozzy restrains a monster

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A PRIZE FOR EVERYONE WHO COMPLETES THE GAME

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You are Bono, a friendly dragon residing in a picturesque sea-castle. As a shrewd business-dragon, keen on "nice little earners", you make your living by selling soap to the giant monsters who bathe in the sea surrounding the castle.

With the aid of your business partner, named Fozzy, you produce the soap by collecting skeletons amongst the castle caverns and then boiling the bones in a cauldron.

However, the castle caverns are fraught with danger: there are monsters who will kill you, spiders who will eat you alive, and glooks who will block your path. It will pay you dividends to also avoid the perilous trapdoors and hidden volcanoes.

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CCI View

Dear Reader

Not exactly standing still . . . No, the computer world — and especially Commodore's part of it —has been far from static. In every area 987 has seen change; and much of it has brought benefits. The biggest area of home computing is undeniably games — or entertainment as we are learning to call it as the range of products stretches from far from the simple shoot 'em ups of early days. Computer entertainment has become very big business and the companies involved are acting like big companies in any field of business. They are taking over their rivals, growing their own organisations, developing higher quality products, becoming more international, spending more money on new ideas and becoming more expert at presenting themselves to the public. The small companies disappear, come in under the protection of the big guys or live precraiously on the edge — dreaming of the chart topper that will make it all come right.

On the more "serious" software side — "Home Productivity" — there has been a noticable falling off of new products for the 64 though the 128 has finally begun to be supplied with software that is worthy of this very good machine. Nevertheless, it is worth noting that virtually no entertainment software has emerged for the 128 that was not really designed for the 64.

"Bigger" entertainment products have moved across to the Amiga which has made a substantial advance with the appearance of the increasingly popular A500. There is no doubt that this has been one of the most important — if not the most important — Commodore event in years. Since the launch of the 64, Commodore has not had a launch with success written all over it as this one. Of course, the pessimists are still saying that CBM might blow it — and the relatively high price for a mass market computer is one factor they cite — but nothing, it's said, is as strong as an idea whose time has arrived and the 16 bit era is unstoppably with us.

Births . . . and of course, deaths . . . Some may think that it is a little premature in announcing the death of the Plus/4- C16 machines. But in the last year the sales of products to run on those machines has fallen dramatically. There was little enough Plus/4 product to begin with and the sale of C16 games, which is as good an indicator as any for both computers, has plunged from about one in six of the total games sold to one in forty. CBM has to take some responsibility for selling those computers without ensuring that they would really get the software support. However, when these computers were reaching the public, Commodore was fighting for survival and that was probably its main concern.

For CCI, it has been a year when we have been able to increase the average size of the magazine by some 25%, giving us extra space for all aspects of Commodore computing, with a price rise too that was happily kept to 10p.

We thank you for the increasing number of letters and for the encouragement that so many of them offer. Keep them coming for we will be making changes and, we hope, improvements over the coming year and we always need to know what you want to see in the magazine — and how you feel about it. All of us at CCI wish you a happy and peaceful 1988.

Yours sincerely,

Antony H. Jacobson
Managing Editor and Publisher

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CRL's Air Terminal

Stratton is an air terminal of the future.

Its control computer has inbuilt logic units that simulate reason, ethics and suspicion, allowing it observe, discount, decide and act swiftly.

However a terrorist bomb explodes . . . The Central Brain which controls the Terminal was damaged.

You are sent to de-activate the Stratton Central Control, rescue those trapped and make the terminal safe again. The method of shutdown is a systematic de-activation by removing all of the circuit breakers scattered about the underground levels — where they are is anybody's guess! Remove the last data bus and you'll trigger a total shutdown of all mechanical and computerised services inside the terminal.

Stratton is for the Commodore 64/128, (c £9.95) (d £14.95).

WordStar CP/M version

WordStar, the leading word processing package, has been improved with the release of WordStar 4. But the upgrade is not only for OS/2 and MS-DOS users. CP/M users are also recognised by Micropro, who have launched a CP/M version and English dictionary.

There is reported to be a growing body of CPM users that is ignored by most software companies. WordStar CP/M is being released with the help of BOOG — an association supporting MS-DOS and CP/M. Jeremy Browne, BOOG Chairman says "Many of our members have the very latest in equipment and software, but still find there is nothing to beat their old dependables, CP/M & WordStar, for the day-to-day work."

Contact: BOOB Limited, 102a Aldershot Road, Fleet, Hants. GU13 9NY. Tel: 0252 543333.

DEMON II
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Dataphone's New Modem

Modem specialist Dataphone Ltd has just launched a new low-cost model, Demon 2, with a range of sophisticated features. It will cost under £80.

Demon 2 features include full computer control, auto dial from the keyboard or directory, and an auto-answer facility for unattended operation. The modem will handle 1200/75 and 300/300 baud rates as well as 1200/1200 half duplex for bulk uploading and can automatically select the correct baud rate for either sending or receiving. It can be used with any computer with a suitable interface and comes with a 25 pin D socket for connection to a RS232/423 port. it has a full three wire telephone circuit (so it will not 'tinkle' the bells of extension telephones on the same circuit) and comes complete with a built-in power supply.

A mains power on/off switch is built onto the front panel, allowing the modem to be powered up independently of the computer so that it does not occupy the telephone line unnecessarily. The front panel also includes six LEDs which show speed, line and computer status.

Internally, the Demon 2 has sophisticated circuitry which enables it to receive and transmit data over poor telephone lines and provides full protection against line transient voltages.

The new machine, with full BABT approval for connection to the telephone system, will be available from the company and dealers from the beginning of November. A fully comprehensive user manual is supplied with the equipment and a full support service is provided by Dataphone.

Software to allow computer users with the Demon II modem to log on to Prestel or Telecom Gold with a single key stroke is available for most computers for less than £50.

Contact: Dataphone Ltd, 22 Alfric Square, Woodston, Peterborough PE2 0JP. Tel: (0733) 230240.

3½" Programs

The apparent lack of software for the new CBM1581 3½" drive is (see review in this CCI) is quickly being remedied. Bytes and Pieces have announced that all programs that they supply will now be available on the new format. They are starting with a useful disk copier called Cannon 128 which allows program and file transfer between drives and onto the 1581. RRP is £29.95. The successful Fontmaster will also be available as will a new program called Helper 128. The wellknown Chartpak, Cadpak, Oxford Pascal, Hackpack, Petspeed can also be obtained from them and they promise a continuing supply of good quality software on the new 3½" disks.

Contact: Bytes & Pieces 37 Cecil St, Lytham, Lancs FY8 5NN. Tel: 0253 734330.

Budget Download

Budget software has always been sold in outlets such as CTN's (confectioners, tobacconists and newsagents) and garages. Now there's another alternative — telesoftware on Micronet, the on-line microcomputing service run by Telemap.

Micronet has just signed up two of the leading budget software houses in the UK, Code Masters and Firebird who are making their whole range of titles available as telesoftware as they are released, with prices as much as 25% below the normal £1.99 RRP.

Commented Micronet's Software Manager Phil Godsell, "Signing up two of Britain's leading software houses is a reflection of the market place's acceptance of telesoftware. We are particularly pleased to be selling their products because good budget games are ideally suited to the medium. Why bother to go to the shops when you can buy from Micronet 24 hours a day — and at a substantial discount? Not only are we providing our subscribers with an excellent service, but we are also giving Code Masters and Firebird an opportunity to increase sales."

Firebird Silver Publisher Chris Smith added, "Budget software is an impulse buy, and telesoftware is the ideal enivronment for it. Priced as low as £1.50 on Micronet, Firebird's software is unbeatable."

Laptop phone link

Laptop users will be able to communicate with mainframes by car-phone using IBM hardware.

The Cellular Radio Connector lets users access IBM's Managed Network Service (MNS) via Vodafone.

IBM is currently carrying out trials with the connector involving insurance representatives, construction workers and travelling salesmen.

Night Raider

The ultimate flight simulator — shoot 'em up — that's what Gremlin says is 'Night Raider'. You take off from an aircraft carrier at midnight and climb high into the night sky. Your only objective is to sink the Bismarck.

Your sophisticated bomber is equipped with every device necessary to help you achieve your goal. As the press of a button a monitor in the centre of the control fascia will provide an infra-red aerial view of the sea below. This facilitates your pinpointing the exact location of your ultimate target.

Everything seems to be going okay. You're on line for a direct hit when suddenly you're under fire from enemy aircraft. You must move around the flight deck to operate your rear guns and still avoid the constant barrage of missiles from enemy shipping as they try and shoot you out of the sky.

Having sunk the Bismarck, you must then fly your plane back to the aircraft carrier you took off from. Easier said that done if your controls have been blown out and your fuselage is still smouldering as a result of aircraft attack.

Coming soon on Commodore 64/128K.

Superior's Richard Hanson listens in to a Bonecruncher Prize radio.

Superior Prize for Bonecruncher

An entrepreneurial dragon named Bono is the amusing protagonist in Superior Software's latest release, Bonecruncher, a perplexing arcade adventure.

Superior have organised an interesting competition with a spectacular prize for everybody who completes the game: a portable radio complete with headphones, a colourful "Bono's Bathing Co." badge and a winner's certificate.

The game turns life in a bath house into a soap opera of Wagnerian complexity, with brilliant music and stunning graphics. Furthermore, Superior have digitised the sound of their own in-house monster having a bath for the loading screen, the result being excellent speech at the beginning of the game.

Superior's Bonecruncher is a series of mind-bending mazes, created by West German programmer, Andreas Kemnitz for the Commodore '64 and 128, and the Amiga. Price £9.95 cassette, £11.95 disk. £14.95 Amiga.

Managing Director, Richard Hanson, commented: "One of the attractions of Bonecruncher is the charismatic personalities involved. Bono, Fozzy and the giant bathing monsters will provide hours of fun and are sure to prove a big hit with the customers."

Super Super Computer

A computer that can outperform the Cray supercomputers has been announced in the US.

Based on the 19th Century work of two mathematicians, the NASA-funded Navier-Stokes computer has been developed at Princeton University for specific NASA applications.

NASA has put $1m into the project, which will make accurate simulation of the effect of air flow on planes and spacecraft during flight.

The 32-bit supercomputer's creator Dan Nosenchuck, said its revolutionary architecture allowed it to perform large-scale applications that have eluded existing machines.

A unique feature of the machine is the architecture of the building blocks, or nodes, which can reconfigure in 50 billionths of a second when a new problem has to be solved.

"A 16-node machine will outperform four Cray 3 machines in specific applications," Nosenchuck claimed. New Jersy-based Concurrent Computer has been licensed to build the supercomputer.

The $250m company claimed it beat some of the biggest computer companies to win the deal. Its success lay in its parallel fast reacting processing strategy.

Microlink Deal with Telecom Gold

A expansion of MicroLink, is now being planned following the completion of a £1.3 million contract with Telecom Gold.

MicroLink was launched in April 1985 as a means of encouraging users of microcomputers to start exploring the exciting new world of electronic communications.

It has become successful, not only in Britain but in Europe, the Middle East and Australasia, as people all over the world found out how easy it was to couple micros to the telephone to create instant allowing a user to type out a letter on his keyboard which can be delivered by the postman the following morning to any home in Britain or the USA.

The "electronic letter" is transmitted in seconds to the postal delivery office nearest the recipient, where it is printed out exactly as it was typed on the computer and then put into a distinctive gold and blue envelope ready for delivery.

MicroLink has also opened electronic gateways to overseas databases. One is to a computer in New York, through which MicroLink subscribers can be instantly connected to leading electronic services in the USA.

Another is to the EEC's communications headquarters in Luxembourg, where users can key in to the biggest dictionary in the world — a multi-lingual computer containing more than 400,000 words and phrases in eight European languages, and which is being added to at the rate of 2,000 words a month.

Said Derek Meakin: of MicroLink "The phenomenal development of MicroLink has meant that we have now outgrown the computer that has served us so well in the last two and a half years."

Starting with a basic electronic mail service, MicroLink has created a growing range of services.

One is a unique link between MicroLink and the Post Office, links with people many thousands of miles away.

The MicroLink service is housed on a Prime 750 computer in Telecom Gold's top security London headquarters. As part of the new deal the service is this month being transferred onto a computer that is four times more powerful — the Prime 9955.

Contact: MicroLink 061-456 8383

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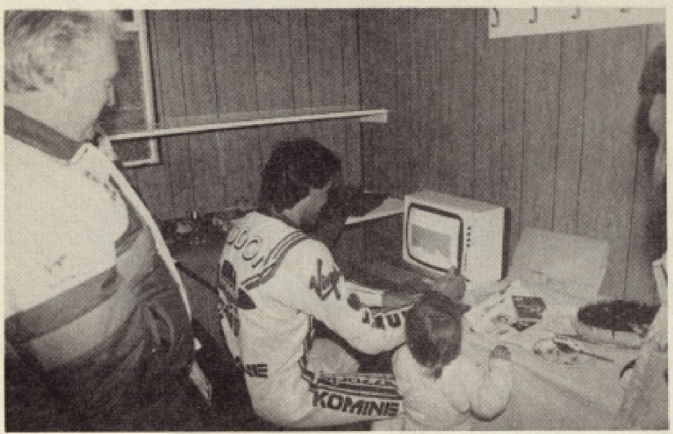

Paul Iddon tests his skills.

D.I's Comp Winners Bobsleighing Day

T.T. RACE Competition Winners were given a chance to test their skills, on snow and ice, with BOBSLEIGH — D.I.'s latest simulation.

This was all part of a exciting day for prizewinners John Taggart and Denis Newell, spent at Brands Hatch. As guests of DIGITAL INTEGRATION they were given a grandstand view of the practice and championship races at the Power Bike International. Then John and Denis, both avid bike owners and racing fans, met the entire SUZUKI racing team including their three championship riders Roger Marshall, Paul Iddon and Phil Mellor.

Suzuki riders and the winners were the first to try BOBSLEIGH and all rated it another hit from D.I. Though it seems that being an ace on the road didn't guarantee success on the snow and ice of BOBSLEIGH!

Alternative World Games

Remember when the Olympic Games were free from diplomatic blunders and political boycotts? When sportsmen and women competed against one another for the sheer challenge and fun of it? Well Gremlin have set out to recapture the very essence of this spirit in a new sports spoof — 'Alternative World Games'.

Guided through the menu by the resident parrot, up to eight players are each able to choose one of eighteen countries to represent. Once chosen, the parrot will pick a card showing the relevant country's flag on it.

Each game takes place at a different location. Sack racing in Naples, Boot throwing at the Colosseum, Pole climbing in Verona and Running up walls in Venice!!! After that, try your hand at piling plates, jumping rivers, pogoing and pillow fighting.

C64/128K £9.99 (c) £14.99 (d).

Mindscape's Superstar Soccer

Using the same ingenious technology as the best-selling 'Superstar Ice Hockey', DesignStar Consultants have recreated "the feel of the playing field, the buzz of the front office and hustle of the strategy room." In Mindscape's 'Superstar Soccer', one or two players can challenge the computer or compete against each other. This is very much a US version of soccer, Mindscape tell us.

"Feinting, trapping, kicking and juggling are just a few of the skills you must master to become a player on a SportTime Soccer League team. If your endurance isn't what it used to be, you can coach the team, using your field experience to run the training camp, make lineups and call the on-field strategies. Do you want to be involved but are tired of getting your feet dirty? The role of team owner/general manager will test your talent-spotting acumen. Existing players age with each new season, and it's up to you as owner to decide who to trade and recruit as you prepare your team for a championship season."

'Superstar Soccer, created by DesignStar Consultants, is for 64/128 at $34.95, and is coming soon for the IBM PC at $39.95. The program will be available in the first quarter of 1988 for the Amiga.

Your Mainframe is Coming

If you've ever wondered what it might be like to have the power of a mainframe computer at your fingertips, you may get the chance to find out more quickly than you think. Eckhard Pfeiffer, the head of international operations of the second largest PC computer company in the world, Compaq, says that in the 1990's desktop personal computers will match the performance and power of the mainframes of today. He predicts that they will have 500 times the memory capacity of the PC's of 1987.

His view is that they will be 32 bit machines with a speed or more than 8 million instructions per second. The next decade's PC will have at least 16MB of main memory and will not use floppies but have at least a 10 Mg Hard Disk. He also thinks that ROM will be at least gig a byte an its will have neat little 15" flat display panels wth a little matter of a 1 million pixel resolution. Those powerful PC's, he says, will also integrate voice, data and video functions. And now for the good news ... Pfeiffer predicts that they will cost no more than the present day desktop PC's. Compaq is now selling over a billion dollars a year worth of PC's, so he should know what he is talking about, shouldn't he? Roll on the 1990's!

(Computer) Time is not of the Essence

When do you want it? Yesterday! Not if it is concerned with computers ... A company in the insurance business, Sturge Holdings, has started a rewrite of its software that could take ten years. It has brought in consultants on a contract that has no finishing date. They are helping to implement a system for IBM's DB2 database running on an IBM mainframe. No-one apparently knows how much it will cost either but it will certainly run into millions of pounds, especially as the consultants, Arthur Andersen, already have thirty people working on it.

Not quite in the ten years class but no far short of it is a software package that has just had its first stage deliver after seven years. The U.S. software company Continuum is creating a special program for a group of insurance companies in the U.K. and elsewhere.

Last year, one of the insurance companies, Sun Life, installed a special mainframe computer, an IBM3090, especially to run the program called CCA. Although it got the first part of CCA in July it still cannot run it until it gets the rest of CCA sometime next year. The cost of the development of CCA will be around £30 million. Sun Life said "If it all works the software will be sensational". £30 million and eight years? We hope for their sake that it does work sensationally.

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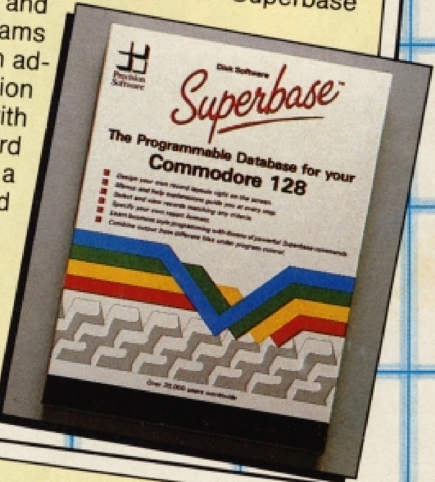
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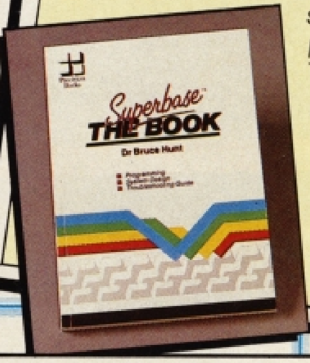
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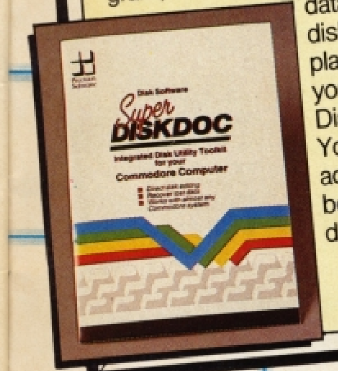
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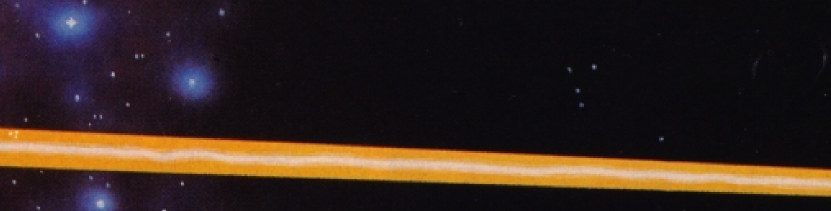

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See the Winter Olympics with Tynesoft

Leading TV sports' commentator, David Vine, has written an introduction to a booklet on the Winter Olympics, which is available free with Tynesoft's new game Winter Olympiad '88.

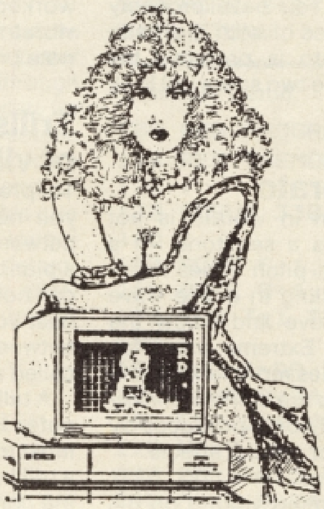
Winter Olympiad, Tynesoft bvelieves is probably the best winter sports' simulation seen yet and, with the preparation for the Winter Olympics in Calgary, Canada, nearing completion it is timed to catch the atmosphere of winter sports.

David Vine is one of the world's leading winter sport commentators and certainly the most travelled. He has been connected with the Winter Olympic Games for the last 20 years and his commentaries are heard throughout the world. His BBC TV programme "Ski Sunday" has just celebrated its 10th anniversary.

Tynesoft have also arranged a competition in which the lucky winner will win the holiday of a lifetime for two to the Winter Olympics in Calgary, departing Gatwick at 10.50 a.m. on Tuesday 16th February direct to Calgary. The winner and companion will be staying in the heart of the Rockies, in the beautiful small town of Banff for the next 7 days and arranged trips will take place to see the 90 metres Ski-Jump, the awe-inspiring 2 man BobSled at Olympic Park; the Men's Alpine Ski-ing event and a trip to the magificent Saddle Dome in Calgary for Figure Skating.

To enter the competition all you have to do is put in the correct order the 8 most important qualities you feel are needed to make a No. 1 Alpine Skiing athlete:
1. Fitness 2. Dedication 3. Endurance 4. Co-ordination 5. Concentration 6. Competitive spirit 7. Determination 8. Nerve.

The competition is open to those who have purchased the game and the closing date is 30th January 1988.
The game is available for the:- Spectrum, Amstrad and C.16/Plus 4, £7.95 (cassette) Commodore 64, Atari XL/XE and BBC/Electron £9.95 (cassette) BBC/Master Compact, and Atari XL/XE £14.95 disk Amiga, Atari ST and IBM £19.95 (disk)



Girls of the Riviera

Do you like girlie calendars? Well, if you've got an Amiga you do not even have to pin one up on the wall. A U.S. company is offering by giving you a 1988 calendar on a disk (we quote) "Each month you'll discover a new girl, beautifully and tastefully rendered, with that unique look that has made the French Riviera so famous" (Whatever that may be!) The calendar, priced $24.95 is called — as if you hadn't guessed — "Girls of the Riviera" and you get 5 macro keys as well as a clock and memory minder thrown in free.

By the way, after this "tasteful" text there's a little note that says "WARNING — ADULT MATERIAL" You have been duly warned. For those anxious to find out the date from their Amiga, Contact Graphic Expressions, Box 110028 Nutley, New Jersey 07110.

The 8910A and the top of the range 8850A

Newbury's New Printers

Newbury Data is now showing its range of disk drives which support the leading industry interfaces.

The new 8000A series features include the ability to skip print positions when there are more than four consecutive spaces on a line, to produce exceptionally fast print speeds. The series also features what is claimed to be one of the fastest head turnaround times of any printer range on the market, allowing very fast acceleration and deceleration of the print carriage at line ends, thereby increasing the amount of time spent printing at the quoted speed.

There are four models within the range: the entry level 8820A prices range from £975.00 to £2200.00 (plus VAT) offers print speeds of 237 Pages Per House (PPH) and the 8910A offers 378 PPH. The 8846A is a new single headed printer rated at 378 PPH which has a specially designed enclosure to ensure a low noice level of less than 55dBA, for office based operations. Sharing the low noise feature is the top-of-the-range 8850A — a 446 PPH double-headed printer that is claimed to be more cost effective than equivalent heavy duty printers on the market.

Newbury Data is the UK-based member of the European Printer Performance Test (EPPT) Group. Following growing industry dissatisfaction with the current printer performance measurement unit of Characters Per Second (CPS), due to its representation of only the maximum print speed on a line of type, the EPPT Group has introduced a new unit of Pages Per Hour (PPH) in order to offer users realistic performance figures.

Newbury Data Recording Limited is Europe's leading independent designer, manufacturer and supplier of computer peripherals, including dot matrix printers, hard disk drives, VDUs and computer supplies. All Newbury Data products are fully supported by comprehensive support and maintenance services. Newbury Data Recording Limited is the largest subsidiary of the DRI Holdings Group of companies, with subsidiaries in the USA and Europe, and distributors worldwide.

EASY MUSIC

Commodore 64
Music Part 5

Ian Waugh shows how to make SID wobble, warble and repeat itself repeat itself repeat itself . . .

In order to make a sound more interesting there are many effects you can apply to it. The musician can buy a mountain of effects, pedals and boxes to produce, sustain, echo, reverberation, chorusing, phasing, flanging . . . the list goes on. This month we'll see what effects can be produced on the 64.

Vibrato and Tremolo: pitch and amplitude modulation

These are so much a part of natural sounds and music that they really do add an extra dimension to the relatively lifeless triangle or square wave. There exists a certain amount of confusion over these two terms, even among musicians, so if any exists we'll clear it up now.

Vibrato is a frequency modulation (ie. it affects pitch), tremolo is an amplitude modulation (ie. it affects volume). The modulation is usually regular and consists of an increase and decrease in pitch or volume above and below the note's pitch or volume level. A graph of this variation would be similar to a sine wave.

Not many instruments produce tremolo. Electronic organs produce it mechanically and electronically and singers often use vibrato or tremolo to enhance their tone. Vibrato is far more common and often used by strings, woodwind and many brass instrumentalists.

The most pleasing rate of modulation in both vibrato and tremolo is around seven cycles per second and the amount of modulation can vary from the subtle to the ridiculous. You have probably discovered examples of both in arcade type games. Vibrato is probably the most common of the two so we will look at that first.

Creating Vibrato

The pitch variation in vibrato is not usually as great as a semitone. In a musical vibrato the pitch varies regularly, rising and falling in a sine wave pattern moving above and below the pitch of the note. Extreme examples where the pitch varies more rapidly and over larger intervals are still technically vibrato but are really only produced by electronic means for special effects.

Unfortunately, we have no easy means of programming vibrato on the SID chip. The most straightforward way to produce it is to alter the pitch continuously above and below the selected note. We would have to do this in real time, running through FOR/NEXT loops. Also, to maintan an even vibrato, the loop increments would have to be different for each pitch.

An alternative would be to modulate the pitch according to the output of oscillator 3 set to a very low frequency triangle wave. This is a simpler method but neither are 100% solutions from BASIC. Yet another alternative is to use ring modulation. Although not its prime task, it can produce a vibrato effect.

The tremolo arm on a guitar, popular in the 1960s, actually produces vibrato. By stretching and relaxing the strings, the pitch rises and falls. If the arm is worked rapidly it produces a regular vibrato; if it is used slowly it stretches the note producing a portamento.

Trills: a special kind of vibrato

To produce vibrato on an instrument you need control over the pitches in between individual notes. The notes on a piano, for example, are fixed and you can not produce vibrato on a piano. The best you can do is to alternate rapidly between two adjacent notes and this is called a trill.

A trill is an oscillation between discrete notes and as such can be played by most instruments. If we want to include a trill in a piece of music we can instruct the computer to play the two notes just as we would instruct it to play any others. A trill can be played over any interval.

Chorus, phasing, flanging and other spatial effects

These have been grouped under one heading because, although they each have their own character, their effects are produced by delaying a sound and/or varying its pitch or frequency. They are called spatial effects because they alter our perception of the environment we think produced the sound — just as reverberation can make us think a sound originated in a big theatre.

Chorus

When a group of musicians play in unison, they each play a slightly different pitch. This difference is very small but it tells the ear that there is more than one instrument. This is known as a chorus effect and is responsible for the beautiful sound of a string orchestra. Commercial chorus units produce their effect by slightly altering the pitch and recombining it with the original sound.

If we program the same pitch into two or more different channels, the pitches should be exactly the same. If we alter the pitch of one channel by a small amount, say ¼ of a semitone, this will produce a chorus effect. The greater the pitch difference, the more pronounced and less subtle the effect. We can really go to town and use three channels with a small pitch difference between each.

As an example of how you can use this effect, one of the programs produces a sound like an accordion. The effect is produced by deducting 30 from one of the low byte pitch values. It's not a very versatile method as you may want to use pitch values with low bytes less than 30 and pitches considerably higher or lower will not produce the same effect.

Apart from showing what can be done it also illustrates the necessity for better control over notes and effects. Although we haven't had to enter separate data for the two channels we have had to enter a considerable amount of numeric data which is not easy to understand or debug. For a short program of this size it's not too much trouble but in longer programs it could cause serious debugging problems. We'll look at an alternative method of data entry for longer pieces of music in a later article.

Beat frequencies: the weaving in and out

When playing two notes which are slightly out of tune, especially with lower notes, you will hear the frequencies weaving in and out and, at times, the note or notes almost cease. This pulse is called a beat and is produced whenever two notes sound at not quite the same frequency. The beat frequency is the difference between the two pitches.

Tremolo

Like vibrato, tremolo is not very easy to produce on the 64 either. The demo program, however, produces an excel-

French Accordion Music

```
100 REM PROGRAM 8.2
110 REM FRENCH ACCORDION MUSIC
120 REM USING CHORUS EFFECT
130 :
140 GOSUB 310:REM SET SID PARAMETERS
150 :
160 FOR N=1 TO 14
170 READ HF,LF,D
180 POKE S+1,HF:POKE S,LF:REM PITCH 1
190 POKE S+8,HF:POKE S+7,LF-30:REM PITCH
 2
200 POKE S+4,33:POKE S+11,33:REM SAWTOOT
H ON
210 FOR I=1 TO 200*D:NEXT:REM DURATION
220 POKE S+4,32:POKE S+11,32:REM SAWTOOT
H OFF
230 NEXT
240 END
250 :
260 DATA 18,209,2,23,181,2,39,223,2,37,1
62,12
270 DATA 18,209,2,25,30,2,39.223,2,37,16
2,10
280 DATA 29,223,2,33,135,3,19,239,1,18,2
09,1,16,195,1,18,209,4
290 :
300 REM SET SID PARAMETERS
310 S=54272
320 FOR I=STOS+24:POKEI,0:NEXT:REM CLEAR
 SID
330 REM ADSR: A=8 D=13 S=00 R=9
340 POKE S+5,141:POKE S+6,9
350 POKE S+12,141:POKE S+13,9
360 POKE S+24,15:REM SID ON VOL=15
370 RETURN
```

Tremolo Demo

```
100 REM PROGRAM 8.3
110 REM TREMOLO DEMO
120 :
130 GOSUB 330:REM SET SID PARAMETERS
140 :
150 POKE S+1,16:POKE S,195:REM MIDDLE C
160 POKE S+4,17:REM TRIANGLE ON
170 FOR T=1 TO 20
180 :
190 FOR I=DP TO 15
200 POKE S+24,I
210 FOR D=1 TO SP:NEXT
220 NEXT
230 FOR I=15 TO DP STEP -1
240 POKE S+24,I
250 FOR D=1 TO SP:NEXT
260 NEXT
270 NEXT
280 :
290 POKE S+4,16:REM TRIANGLE OFF
300 END
310 :
320 REM SET SID PARAMETERS
330 SP=5:DP=5
340 S=54272
350 FOR I=STOS+24:POKEI,0:NEXT:REM CLEAR
 SID
360 REM ADSR: A=0 D=0 S=15 R=0
370 POKE S+5,0:POKE S+6,240
380 RETURN
```

lent tremolo but it would affect all the channels. In line 330, SP controls the speed and DP the depth. DP should be between 1 and 15 and SP can be any number over 0.

While vibrato is more musically useful, the ful potential of tremolo has not been realised and its use as a source of sound effects can lead to something just that little bit different.

ECHO ECHo ECho Echo echo and reverberationnn

These are probably two of the most overused effects in the synthesist's armoury. They are great fun to play with which is why they are overused but in the right hands they are capable of creative and beautiful effects.

Echoes are produced when sound waves are reflected from a smooth hard surface such as a cliff. If you stand before a cliff and shout, the sound waves produced by your voice will hit the cliff and bounce back. The time lag will depend upon your distance from the cliff. In order to hear the reflected waves as a separate echo they must be separated from the original sound by at least one tenth of a second which means you must stand at least 54 feet away from the cliff. If you are closer than this, the echo will not seem distinct but will seem to be a continuation of your original shout.

A sound emitted in a room will bounce around the walls, floor and ceiling. As the reflections bounce back and forth, the result is a most complex series of multiple reflections. The net result is a reinforcement of the sound and it will seem to continue after the original sound source stops. This is a form of echo called reverberation, where the individual echoes are not discernible.

Rooms with reflective surfaces have longer reverb times than rooms with insulated walls which is why more people prefer to sing in the bathroom than in a padded cell.

Most commercial reverb units produce their effect by means of a spring or metal plate and there are many digital units available now. Because of the enormous number of vibrations involved, reverb is not possible on the 64 (although you can feed the output to a reverb unit). The best we can do is to program a longish release in the envelope. We can, however, imitate an echo.

Commercial echo units

An echo is a single repeat of a note. Echo units are capable of producing from one to say, five or six echoes. Many can produce even more and some are capable of an infinite number. A quality of natural echo, which you will be aware of, is that each echo is quieter than the preceding one. If an echo is repeated many times, there is a limit to how low the volume can go without becoming inaudible altogether and most units allow you to control the repeat volume so the echoes fade quickly or slowly.

Producing echoes on the 64

As a starting point, assume we want to repeat a series of single notes. To produce an echo, there must be a discernible gap between notes which means the volume has to drop and rise again. We can do this by playing the notes while reducing the volume.

The demo program produces a rather good echo but you will probably also hear a click as new values are POKEd into the volume control register at line 200. Using lower pitches and other waveforms will help cover up the click.

In line 310, EC controls the number of echoes, select a number between 1 and 14, the lower the number the more echoes. DU controls the duration of the echoes and ultimately the length of the note. Alter them and hear how they effect the notes.

It's fun to experiment with these effects. You can use them in a piece of music or to enhance a sound effect in your latest program.

Next month we'll see how the noise waveform can be used to produce sound effects and an electronic drum machine.

I.W.

Echo Demo

```
100 REM PROGRAM 8.4
110 REM ECHO DEMO
120 :
130 GOSUB 310:REM SET SID PARAMETERS
140 :
150 FOR I=1 TO 5
160 READ HF,LF
170 POKE S+1,HF:POKE S,LF
180 FOR E=15 TO 1 STEP-EC
190 IF E<1 THEN E=1
200 POKE S+24,E:REM VOLUME
210 POKE S+4,17:REM TRIANGLE ON
220 FOR D=1 TO 25*DU:NEXT
230 POKE S+4,16:REM TRIANGLE OFF
240 NEXT E
250 NEXT I
260 END
270 :
280 DATA 79,191,67,15,53,57,50,60,33,135
290 :
300 REM SET SID PARAMETERS
310 EC=5:DU=5
320 S=54272
330 FOR I=STOS+24:POKEI,0:NEXT:REM CLEAR
 SID
340 REM ADSR: A=0 D=0 S=15 R=9
350 POKE S+5,0:POKE S+6,249
360 RETURN
```

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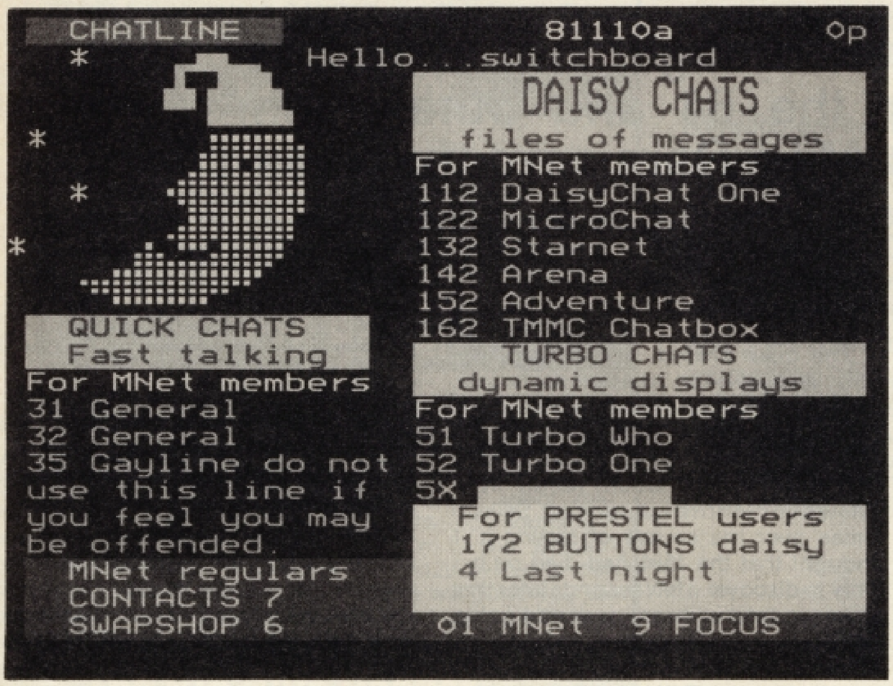

```
 CHATLINE              81110a         0p
 *               Hello...switchboard
                       DAISY CHATS
 *                  files of messages
                  For MNet members
   *              112 DaisyChat One
                  122 MicroChat
*                 132 Starnet
                  142 Arena
                  152 Adventure
 QUICK CHATS      162 TMMC Chatbox
 Fast talking          TURBO CHATS
For MNet members    dynamic displays
31 General        For MNet members
32 General        51 Turbo Who
35 Gayline do not 52 Turbo One
use this line if  5X
you feel you may    For PRESTEL users
be offended.        172 BUTTONS daisy
 MNet regulars      4 Last night
 CONTACTS 7
 SWAPSHOP 6        01 MNet   9 FOCUS
```

Last month we looked at the editorial section of Micronet for Commodore owners, Solely Sixty Four and More. In this issue we discover chatlines and more...

Chatlines are all about communicating, instantly. And with 20,000 subscribers, there are plenty of people to talk to. No surprise then that Chatlines clock up over ten million accesses every month!

The main form of Chatline, which was originally conceived and ran on a humble BBC Micro, is called Daisychatline, where a daisychain of a hundred messages is displayed at any one time. When a hundred 'Chatline' messages have been sent the oldest is overwritten. But Micronet didn't realise how popular Daisychatline would be, and soon it became obvious that a BBC Micro couldn't cope with the demand. Hence an upgrade to a GEC mainframe. The current system allows a Micronet member to send a message which then appears on screen for everybody to see, and if they so desire, reply to. The result: a real-time conversation (or an argument!) between two, ten or more people.

Quickchat came next. The difference is that only one message is displayed — there's no archive at all — you don't have to press any keys to see the messages. You just sit back and watch the conversation, only touching the keyboard when you want to join in.

A variation on the Quickchat theme is Turbochat, where instead of one lengthy message appearing, four shorter ones are displayed on the screen. Again no interaction is necessary until you want to take part.

As well as the regular Chatlines, there are also a couple of special versions which Micronet likes to call 'shows'. One is Celebrity Chatline, where a famous person from either the world of computing or show-business is interviewed 'live' from Micronet's London headquarters by Micronet subscribers from all over the UK.

The idea is not unlike a radio phone-in programme. The guest sits by a computer terminal and reads questions sent in by Micronetters. He or she dictates an answer to a Micronet journalist and within seconds 20,000 people can read the reply. Guests have ranged from the boss of Commodore to Sir Clive Sinclair or Douglas Adams to Selina Scott and the editor of CCI. More often than not, perhaps because it's so different, guests with busy schedules will stay for much longer than they planned.

More recently Micronet has introduced a service called Line Noise, which is not unlike Celebrity Chatline in format, except there isn't a celebrity! Presented by a Micronet staffer four nights a week betwen 8pm and midnight, the conversation is based around current affairs — computer discussion is usually banned, there are other Chatlines for that — and prize competitions. Although only scheduled to run till midnight, the presenter and Micronetters sometimes get so carried away that it continues until morning.

As well as the variety of Chatlines, an important part of communicating on Micronet is through electronic mail. All Micronet members receive a unique mailbox number when they join. This allows any other user to send him or her a personal letter electronically, in other words instantly. And not only is it quicker to send an electronic letter, but it's also cheaper!

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Contact: Micronet Tel: 01-278 3143 or Durrant House, 8 Herbal Hill, London EC1R 5EJ.

1581

CBM have brought out a new 3½" drive for the 64 and other Commodores. Mike Garamszeghy gives it a thorough technical evaluation.

A few days before turning the big 3-0, I received a birthday present in the form of a little plain brown box from Commodore, courtesy of Dan and Jim at Westchester. Inside, I discovered CBM's latest offering for its 8-bit line: the 1581 3½ inch disk drive. (Although the label on the front of the drive specifically says "FLOPPY DISK DRIVE", I refuse to call a 3½ inch disk "floppy", especially when my 1571 merely says "DISK DRIVE". For those not familiar with a micro disk, it is encased in a rigid plastic housing making it the least floppy of flexible disks.)

This little beast is compact, quiet, fast, and versatile. In runs on the standard or fast serial port and is primarily designed for use with the C-128, but works quite nicely with the C-64, Plus-4, C-16 and even the VIC-20. Early prototypes were reported to have problems dealing with the slow serial bus of these other machines, but these appear to have been corrected now. The external power supply allows the drive to run much cooler than the 1541 or 1571. It still runs a bit warm, but nothing like my dual purpose toaster-cum-1541 disk drive.

The physical size of the 1581 is miniscule compared to the 1541/1571 type drive. The drive is small enough to rest nicely on the "ledge" behind the keyboard of my C-128. The only physical layout item which might be confusing to 1541/1571 owners is the location of the power switch. On the 5¼ inch drives, the switch is in the right rear corner. On the 1581, it is in the left rear corner. When you are used to fumbling around on one side to turn the drive on, switching sides isn't fair. On the 1581 this is readily overcome due to the small dimension. Just by putting your hand behind it, one finger is almost bound to be in contact with the switch, no matter where it is. The 3½ inch disks hold more than twice as much data as a double side 1571 5¼ disk! The built in rigid plastic cases of 3½ inch disks make them much easier to care for, transport without the box, send in the mail, etc.

The quiet smooth operation of the 1581 is a joy (not) to listen to. In fact, with the exception of a slight click as the head steps between adjacent tracks or a low pitch squeal as it homes onto a distant track, you would hardly even know that the drive was running. Several times over the course of testing it, I thought that the 1581 had died on me only to discover a few seconds later that it was indeed alive and well and going about its normal business.

Inside, the 1581 is nicely laid out with a well shielded CHINON 80 track drive mechanism connected to the main circuit board via a plugged multi conductor ribbon cable and a smaller dual conductor cable. The main ribbon cable edge connector on the drive mechanism appears to be a standard type, perhaps a SASI. If this is the case, it might be possible to use the controller board with its built in DOS to interface to other "standard" type drives such as 80 track 5¼ inch ones. Hmmm . . .

Specifications

The technical parameters are summarized in Table 1. Note the difference between the "physical" and "logical" organisation of the disk. This will be explained in greater detail later. Also note the mention of directory partition. This too will be explained later. A couple of the 1581's more salient points are its capacity (800k or 3160 blocks free) and speed (average about 1.5 times as fast as a 1571 when used with a C-128 or 1.5 times as fast as a 1541 when used with a C-64, etc.). Unlike the 1571, the full capacity of the drive, along with its advanced features (except burst mode), are available to all computers capable of supporting the serial port.

Large sequential, program and user files are limited only by disk space (or available computer memory). Large relative files are fully supported up to full disk (minus, of course, the overhead for side sectors, etc.) size by the use of "super side sectors" or extended side sector blocks.

Table 1: 1581 Technical Specifications

Total formatted capacity ***808,960 bytes,*** *Number of directory entries* ***296 (each directory partition),*** *Maximum SEQ file size* ***802,640 bytes,*** *Maximum REL file size* ***800,000 bytes (approx),*** *Maximum records per REF file* ***65,535,*** *Number of DOS RAM buffers* ***9 (7 I/O + 2 reserved for BAM),*** *Track cache buffer* ***5 K bytes,*** *Recording format* ***MFM (IBM system 34).***

Physical Disk Organisation: (as seen on the disk)

Number of sides ***2 (numbered 0 and 1),*** *Number of track per side* ***80 (numbered 0 to 79),*** *Number of sectors per track* ***10 (numbered 1 to 10),*** *Number of bytes per sector* ***512***

Logical Disk Organisation: (as seen by DOS)

Number of sides ***1,*** *Number of tracks* ***80 (numbered 1 to 80),*** *Number of sectors per track* ***40 (numbered 0 to 39),*** *Number of bytes per sector* ***256,*** *Number of blocks free* ***3160***

(Note: All logical to physical conversions are done automatically by DOS. Each physical sector is subdivided into 2 logical sectors. Each logical sector begins with the track and sector pointer to the next logical sector, as per normal CBM DOS.)

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Physical Dimensions:

Height ***63mm,*** *Width* ***140mm,*** *Depth* ***230mm,*** *Weight* ***1.4kg***

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continued on next page

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New **128 Helper**

The 128 Helper is the first electronic reference manual for the 128. Let's say you are in the middle of writing a program in BASIC when you realize that you need more information on a specific command, just touch the help key, almost instantly a menu appears with all BASIC commands, select the command in question and a screen of detailed information appears, at the press of a key you return to your BASIC program. The most exciting feature of 128 Helper is the program is user definable. The program will guide you to create your own custom screen files. This program will only cost you **£24.95.**

New **The Big Blue Reader**

New from S.O.G.W.A.P. Software Inc., The Big Blue Reader allows you to transfer files generated on most IBM-Compatible (MS-DOS) software to all three operation modes of the Commodore 128 and vice versa. Thus, files can be transferred to or from MS-DOS, 128 and CP/M disk formats, with optional ASCII translation. You may no longer be discouraged because your 128 is not MS-DOS disk compatible, or that your 128 CP/M disks are not industry standard. The program, which runs in C128 mode, is available for **£29.95.** Detailed information is available on request.

★★ New Little Blue Reader for 64 Users ★★

New **3½" Disk Drives**

The NEW Commodore 1581 1 Megabyte disk drive is now available. The NEW 3½" disk drive is compatible with most commercial software and will operate on the Commodore 128, 64C, Plus/4, C16 and VIC-20. The 1581 offers the professional user, 808k formatted disk capacity (3160 Blocks Free), 8,000 Bytes per second transfer rate and sub-directories. Commercial software available includes HackPack, Petspeed, Oxford Pascal, GEOS 128, Fontmaster with Spellmaster, CADPAK and Chartpak. The disk drive is available by mail order only for **£199.95.**

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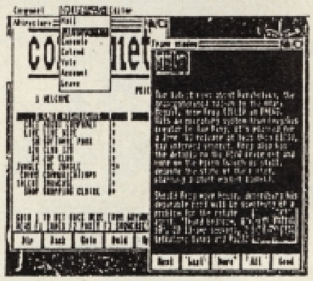

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continued from previous page

Table 2: Summary of Disk Drive Test Speeds

Operation	Disk Drive/Computer			
	1541/C-64	1571/C-128	1581/C-128	1581/C-64
FORMAT disk	80	40	100	100
LOAD short	4.5	1.5	0.4	3.5
LOAD long	93	11.5	6.4	75
ZAP LOAD long				30
Burst LOAD short		0.4	0.4	
Burst LOAD long		10.4	5.3	
SAVE short	6.5	5.7	2.1	4.5
SAVE long	100	71	31.5	52
WRITE SEQ file	9.3	7.8	5.7	6.8
READ SEQ file	8.1	4.6	3.8	7.3
WRITE REL file	155	109	57.3	89.5
READ REL file	80	77	32.3	37.5

Notes:
1) All times are in seconds and were obtained using the CIA #2 TOD clock as a timer. The times you get may vary depending on disk usage (i.e if the files are stored contiguously or not, and how far the head has to move to access the files).
2) The short program is 5 blocks in size and the long is 146 blocks.
3) ZAPLOAD 64 is a fast loader for the C-64 and 1581 which is supplied on the 1581 demo disk. It takes 6 seconds to load.
4) The SEQ file consists of 100 strings of 24 characters each. File read and writes are via BASIC's INPUT# and PRINT# statements in a FOR-NEXT loop.
5) The REL file consists of 100 records of 64 bytes long each. Records are read and written in BASiC in pseudo-random order (100, 1, 98, 3, ..., 99, 2) designed to maximize record searching. Record positioning commands given twice for each record. The write speeds include initial creation of a 64 byte x 100 record file.

A speed test of the 1581 and comparison to other computer/drive combinations is summarized in Table 2. The tests were conducted with a C-128 running in slow (1 MHz) mode and C-64 mode using the CIA#2 TOD clock as an automatic hardware timer. The TOD (or time of day) clocks are very accurate and hardware based on the system clock. They are not affected by disk operations and system interrupts. Unfortunately, the TOD clocks (one for each CIA) are not used in CBM ROMware. All functions were performed from BASIC using commands such as LOAD, SAVE, PRINT#, INPUT# etc. The relative file test included double record positioning, although the 1581 manual assures us that this is not required for the 1581. (It is still used in the examples in the manual to "maintain compatibility with other drives"). At the start of each test, the disks contained identical sets of test files, stored in the same order. The speeds are only meant to be relative indication of disk I/O from BASIC for a given set of conditions. Disk I/O speed depends on a number of factors such as where (i.e. proximity to directory track) and how (contiguousness) a file is stored.

As you can see, the 1581 is considerably faster in all modes of operation than either a 1541 or 1571. The increased speed is primarily due to the track cache used by the 1581 to buffer an entire track at once in RAM for all I/O operations. After reading an entire track into RAM, any further references to that track, either reads or writes, only involve RAM to RAMtransfer of data. The track cache is then written back to the disk if it has been changed by DOS. Incidentally, the 146 block file burst loaded in 5.3 seconds with 1581/C-128 combination is a blistering 7000 (you say it right folks, SEVEN THOUSAND) bytes per second!! It is also interesting to note that when used with a C-64, the write speed is consistently faster than the read speed! Anyone care to hazard a guess on the reason for this?

1581 DOS

The 1581 disk operating system supports all of the standard DOS commands of other CBM drives that we have come to know and love and contains a number of refinements over these previous DOSes. Since the DOS was supposedly rewritten from scratch for the new hardware, the notorious SAVE@ and relative file bugs are said to be finally and totally eradicated. (At least, they have not surfaced yet.) Burst mode is also supported for C-128 users. The 1581 burst command set is virtually identical to the 1571 set wth a few changes to the utility commands:

"u0>b0" forces the serial bus to slow mode (default for a C-64, etc.)
"u0>b1" forces the serial bus to fast mode (default for a C-128)
(These two take the place of the "u0>m0" and "u0>m1" mode commands on the 1571).

"u0>v0" turns on verify after write
"u0>v1" turns off verify after write

"0>mr"+chr$(>memory address)+chr$(number of pages); and
"u0>mw"+chr$(> memory address) +chr$(number of pages)

These are read and write commands allowing transfer of multiple blocks of data (in 256 byte pages) via burst mode. This allows direct reading and stuffing of the track cache buffer. In addition, a new switch bit has been provided for the burst read and write commands to select logical or physical track and sector numbering systems.

An extended block read and block write command set is also provided. "b — R" (that's b — <shift> r) and "b — W" (b — <shift> w) are similar to "ua:" and "ub:", except that DOS does not check to see if the track and sector numbers fall into the rang and it normally expects. Presumably, this is so that you can read and write non-standard disks, maybe even weird copy protection schemes and foreign disk formats, with block read and block write.

The 1581 supports extended directory pattern matching. The pattern match character can be placed anywhere in the pattern string. For example:

"*bas" will find all files which end with "bas"
"a*b" will find all files which start with "a" and end with "b", regardless of the length of the filename.

This feature is very convenient for people who append file types, such as "bas", "ml", "text", "asm", "obj" etc. on to the ends of the file names. Searching for a series of assembler source files on a disk is as easy as:

directory "*.asm"

A nice touch, Commodore.

As previously rumoured, the 1581 supports subdirectories or, more correctly, disk partitioning with each partition having its own BAM and directory. Thus each partition can have 296 files name entries. All this comes at a cost: each partition used as a subdirectory also requires 40 blocks of overhead for this additional BAM/directory track. In general, the partitions can be any size, from 1 logical sector up to about half of the disk capacity and are created by a simple DOS command:

continued on next page

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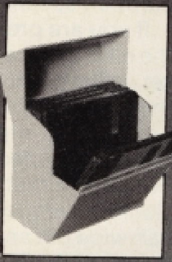

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```
"/0:[partition name]" + chr$(starting logical track#)
+chr$(starting logical sector#) + chr$(< #sectors to partition)
+ chr$(< #sectors to partition) + ",C"
```

This command must be sent from the computer to the disk drive over the command channel, similar to any other BASIC 2.0 type disk operation because neither BASIC 2.0 nor 7.0 supports a partitioning command. The partition cannot overlap the normal BAM and directory areas, hence the limitation on maximum partition size (the BAM/directory track is smack in the middle of the disk on logical track #40).

The partitioning command can be used for protecting almost any size area on the disk from being overwritten by DOS. In real terms, the partition command works by assigning the disk area to a file in the root directory (you can also nest partitions but the procedure soon becomes very complicated) with the new file type CBM. The number of blocks indicated for the CBM files is the partitioned area size. The "file" occupies a continous area on the disk, and once set cannot be easily changed in size without destroying it.

To use the partition as a subdirectory area, several special steps are required. First, the starting logical sector number must be 0. Next, the partition size must be a multiple of 40 blocks (i.e. whole tracks). Third, the partition must be a minimum of 120 blocks long. After creating a partition, it can be selected by:

```
"/0:[partition name]"
```

Once selected, the partition must be formatted before first use as a subdirectory. This is done using the normal DOS format command:

```
"NO:disk name,ID" or
HEADER"disk name",lid
```

The specified disk name and ID code need not be the same as for the rest of the disk. This puts the BAM and directory information into the first track of the partition. MAKE ABSOLUTELY SURE THAT YOU HAVE SELECTED THE CORRECT PARTITION BEFORE FORMATTING OR YOU WILL ERASE THE ENTIRE DISK!! (It is interesting to note that the ID code is not embedded into the sector header data in the manner of 1541/1571 drives and in fact serves no real purpose on the 1581 except as a simple identifier for DOS to tell which disk it has. You can change the ID code as often as you like because it is only stored in certain areas as the Directory header block).

Once a partition has been selected, all reads and writes to disk will be made to files in that directory only. All other files in other directories on the disk will not be found. Copies of files may reside in several partitions, even under the same names, but these are totally separate copies. The root or main directory can be selected by a:

```
"/0:"
```

with no partition name specified.

A few new DOS status and error codes have been provided to indicate the selection of a partition or an illegal partition specification.

If you are protecting a smaller area of the disk, say the BOOT sector, you must set up the partition BEFORE you write to that part of the disk. The partitioning process will wipe clean the area that is being protected. One thing which I do not like is that the CBM files are not "locked" entries. This means that you can wipe out an entire subdirectory with an errant SCRATCH command.

For advanced users, the internal DOS functions, such as read a sector, etc., can be accessed via a KERNAL type jump table in high ROM. All of the most important functions are also passed through individual indirect RAM vectors allowing them to be trapped and redirected. The internal DOS routines also allow you to bypass the track cache and read or write a disk sector directly via one or more of the job buffers. This handy feature frees up 5 K bytes of drive RAM which can be used for custom drive programming. You can stuff quite a bit of ml code into 5 K!

Another feature provided is the automatic execution of an "&" type utility file on power up or soft reset. When a reset occurs, the 1581 searches the root directory for a file named "COPYRIGHT CBM 86", then loads and executes it in drive RAM if found. This must be a USR type "&" disk utility file. It can be used to set up custom programming routines, such as changing the RAM jump vectors, automatically on drive startup or initialization.

Physical and Logical Disks

The 1581 disk is physically configured as 512 bytes per sector, 10 sectors per track, 2 sides, 80 tracks per side. It is interesting to note that the sides on the 1581 are flipped compared to the numbering system used by MS-DOS and ATARI ST disks of the same side (i.e. side 0 is side 1 and side 1 is side 0. Use the demo program at the end of this article to see this for yourself if you wish). The tracks are numbered from 0 to 79 as per the standard MFM numbering scheme, and the sectors from 1 to 10 on each side. The 512 byte physical sector size allows an extra 512 user bytes per track to be squeezed on thus maximising disk usage. The WD 1772 disk controller chip can only handle 18 x 256 byte sectors per track, equivalent to 9 x 512, at its normal recording density when you take into account the overhead bytes required for each sector. The 1581 is a radical departure from other 8 bit CBM drives in that it uses the industry standard IBM System 34 MFM recording format instead of Commodore's 4 for 5 GCR encoding scheme. This means that you can physically read and write other disk types (such as 3½ inch MS-DOS as used in many laptops and ATARI ST) in the 1581, and, perhaps more importantly, read and write 1581 disks in these other machines. Of course, you will need a suitable conversion program because the logical format of each of the above mentioned disk formats is totally different.

For some reason, probably to maintain some degree of similarity with earlier DOSes (although I don't see why because the medium is totally incompatible), the DOS uses a different logical addressing scheme. The logical scheme, which is used by all of the user DOS commands, such as block-read, etc, some of the job queue commands and some of the burst mode commands, consists of:

single side, 80 tracks (1 to 80), 256 bytes per sector, 4 sectors per track (0 to 39). In this scheme, logical sectors 0 to 19 are on side 0 and 20 to 39 are on side 1. There are two logical sectors in each physical sector. As with other versions of DOS, the first two bytes of each logical sector represent the link to the next logical sector in a given file.

The root or main directory is on logical track 40 (physical track 39). The directory header is logical sector 0, BAM for logical tracks 1 to 40 is in logical sector 2 and BAM for logical tracks 41 to 80 is in logical sector 2. The directory proper starts in logical sector 3 and uses the rest of the track. The format for partition directories is identical, except that the BAM is only local for the specific partition.

It should be noted that because the directory and BAM is in a different location on the 1581, any 1541/1571 software that accesses the directory track directly, such as unscratch, directory alphabetising and lock-unlock programs, will not work with the 1581 without modifications.

Utilities and Documentation

The user's guide which comes with the 1581 is clearly superior to any supplied with the 1541 or 1571. It even takes the advanced programmer to heart with memory maps (all be it, not very detailed), a detailed description of the

job queue system works, complete with a listing of job codes, error returns and a BASIC example. The guide contains many more detailed examples than previous guides, but is still lacking in the area of burst mode. The burst mode descriptions are in the same weak format as the 1571 manual with no actual examples beyond a cryptic verbal description. The manual makes virtually no reference to the fact that the 1581 can be easily programmed to read other 3½ inch disk formats, such as IBM PC system 2 and Atari ST. It will not read AMIGA or Macintosh disks directly from DOS due to a completely different physical disk structure. However, with over 5 K space available for custom programming, anything is possible.

The utility disk supplied with the 1581 comes with a number of really useful programs. The back-up routines for both the C-128 and C-64 support expansion RAM and/or multiple drives to minimise disk swapping. A fast loader "ZAPLOAD" is provided for the C-64 which doubles the speed at which files will load. Files to load are selected from a menu. Also included are a sector editor the C-128 (not just "display track and sector") and other utilities for creating BOOT sectors, partitions, etc. The only thing which I did not like about the sector editor was that it works on CBM DOS disks only using logical sector numbers and will not let you examine foreign disk formats very easily. The simple demo program included with this article works with any readable disk type, including MS-DOS, and ATARI ST.

A few hi-res pictures are also included in a slide show for the C-128 in 40 column mode to demonstrate the drive's speed.

Compatibility

As mentioned previously, any program which tries to access the directory track directly with block reads or writes will not find it and therefore, will not work with the 1581 without modification. This includes C-64 GEOS. It will probably take some time before commercial software is supplied in the 3½ inch format, and until it is, you may have to boot up your favourite program on your 5¼ inch drive and use the 1581 for data storage only. A minor inconvenience, but generally livable.

Fast loader, fast copy utilities, nibble copiers and 1541 based copy protection schemes will probably not work with the 1581 because they are too hardware and DOS specific to the older 5¼ inch drives. However, other non-copy protected software works well with the 1581.

C-128 CP/M will currently not boot from the 1581, although I understand that an upgrade will be available. Once booted, CP/M will work, to a limited extent, with the 1581. The physical disk format is very similar to EPSON QX-10 format. Therefore, CP/M thinks it is a QX-10 disk and treats it accordingly. The trouble with this is that you lose half of your disk capacity (QX-10 is only set up for 40 tracks). For those diddlers interested, you can use all 800 K in CP/M mode by changing a few bytes in the CPM+. SYS file disk parameter table using a debug tool such as DDT or SID. Of course, you lose compatibility with true QX-10, but who uses that format anyway?

Final Word

The 1581 is well worth its long delay in getting to market, but like some other products which will remain nameless, its usefulness is limited by the lack of software available for it. In all fairness, I must give the guys at CBM credit for doing an excellent job on this one! Its large disk capacity is a breath of fresh air, especially for C-64 users who have frequently complained about the 1541's puny 170 K capacity.

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Opinion

Jeff Minter takes time out from creating games to defend himself and other shoot 'em up fans against Zach Skinner's attack in last month's CCI.

Well, actually I wasn't on holiday last issue; I can only assume that the vagaries of the Welsh postal service prevented my last article on the PCW show from reaching the magazine on time, and now it has been deemed outdated and so will never be published (except perhaps in an edited form in the next Nature Of The Beast). Having read the 'official' CCI review of PCW you'll all no doubt be labouring under the misguided impression that the industry has 'matured'. It is 'solid' and 'rich'. (Yeah. 'Solid' like constipation. 'Rich' in hype, marketing claptrap, unoriginal licensing deals and be-suited business-people running companies which care zero for the originality of software they produce, having interest only in gaining huge market shares. Whatever happened to 'original', 'friendly', and other such words which could have described the old PCW shows? When the people behind the stands actually used to talk to the people in front of them? No, now we have to make do with 'solid' and 'rich' and 'mature'. Yecchhhh). Oh well, never mind . . .

Anyway, postal service or whatever, it seems my column was taken over last issue by Zack Skinner, who disagreed with my sentiments about the State of the US software market. I feel that I ought to answer some of the points upon which we differed . . .

Firstly, when I was lamenting the lack of shoot-em-ups from the Yanks, I wasn't really asking for more violent software: the point I was trying to make was that the US software producers are getting far too serious in the nature of the software that they produce. What I was after was the return of software that's actually fun — by which I don't mean shoot'em'ups exclusively; I would include such games as Marble Madness, platform/arcade adventure games like the superbly-playable but unfortunately little-known Montezuma's Revenge, and other such arcade-style games which were produced in the US around '83 and '84. Arcade-style such games were, but not usually arcade-clones; companies such as Broderbund and Sirius were producing colourful, playable arcade games (you can't really use that phrase in the old sense, which just meant 'action game', because now whenever you say 'arcade game' people think you mean 'arcade clones', which ain't the same thing at all). The US games were well-programmed, and often richly imbued with the individual style of their creators. US game software was looking good, and getting better, until something happened in '84, and the US arcade game programmers all started getting serious. They stopped having fun, and action-games (to avoid using that confusing phrase again) became the almost exclusive domain of UK programmers. I think that part of the reason for this change of direction in the US could have been the collapse of the dedicated-console market at the end of '83. A lot of the US software firms, such as Activision and Imagic, were heavily involved in producing games for such consoles, and when the bottom fell out of the console market — due to the ascendancy of home micros — the 'pure' action game became tainted due to its association with dedicated consoles. Unfortunately, the UK action-game market has now become clogged with boring arcade conversions, and there is very little individual style within the action-game genre in this country.

No relation to reality

Secondly, and more seriously, I take exception to the way that Mr. Skinner implies that all shoot'em'ups are an incitement to violence, and that they make violence acceptable to those who play them. I agree with him that certain types of game, in which recognisably human forms are the targets to be destroyed, can be distasteful; I remember voicing my misgivings on the subject when 'Who Dares Wins' first emerged on the Commodore. To my mind, the best shoot'em'ups are those in which the action is sufficiently abstract so as to bear no possible relation to reality. When I play a blasting game, it's not because I'm driven by some intense need to kill, kill, kill; I like to play because I enjoy the challenge to my dexterity and (in some cases where a little strategy is called for) my brain; I like to see bright, unusual graphics (I love games like Fantasy Zone on the Sega, where the graphics are detailed and abstract to the point of being surprising — you get to a new level and think 'WOW! look at that WEIRD blue thing with the long nose and the purple pulsating nodes!' — and then you blast it); and I like great sonics, synapse-searing speed, and above all playability. I blast because I enjoy the audio/visual experience rather than because I am driven by a psychopathic Rambo-urge. My own games take this abstract approach to the extreme (do you seriously think that a shoot'em'up fan is going to go out and slash someone with a Stanley knife because he's been whipped into frenzied bloodlust by playing a game in which a camel spits at telephone boxes whilst walking past a scrolling backgroup of giant cigarette packets?

Even the slightly-more literal spaceship-and-alien type games are very, very unlikely to cause the game-playing masses to turn on their mothers with an axe. They're representations of a scene which could never have a counterpart in reality. They're just escapism. There is no stimulus in the gameplay which is likely to be replicated in the real world strongly enough to cause the player to transfer his aggression to it. It's like Star Wars: taken at base level, you look at the film Star Wars and it has plenty of violence — pilots getting zapped left right and centre, whole planets destroyed, laser battles and loads of blasting — but it's a kid's film. A fairytale. It's so far removed from reality that it represents no threat.

Rambo, though, that's a different manner. I do agree with Mr. Skinner in that games which graphically represent death or dismemberment of human forms are unpleasant. I have never been fond of 'beat'em'ups, having rapidly got bored with them; and hacking up and dismenbering have never been my scene (and some recent adverts, 'Rygar' in particular which shows in graphic detail an enemy soldier being disembowelled with a buzz-saw, are quite revolting).

Wargames

Another thing. Mr. Skinner mentioned nothing of two of the categories I referred to as replacing harmless arcade games. These two categories were: simulations and wargames. Okay, sport simulations are harmless, but what of Wild Bill Steeley and his arsenal of simulated death-hardware? Is that not far more insidious than a harmless space blaster? Encouraging kids to play with simulations of real hardware that takes real lives in real wars? And wargames — re-constructions of bloody warfare, to be rerun and treated as a game — trivialising war, treating it as a pastime? Should not Mr. Skinner be more concerned about these — which are the very things I was complaining that the Yanks have turned to instead of arcade games?

In conclusion, I'd like to re-iterate that the majority of shoot'em'up authors are not interested in inciting any mindless violence, nor are zappers likely to mutate into future Michael Ryans due to their enjoyment of blasting games. And as for 'what goes on in our heads', well, I suggest that Mr. Skinner check out some of the work I'm doing on Colourspace — a TOTALLY peaceful, non-competitive, constructive leisure activity. And I would present myself as an example — I have made my living by producing fast, furious shoot-em-up games, yet in the real world I have never been in a fight; I detest killing in any form; I don't even eat dead animals because I prefer them alive — so please don't try and make me out to be a peddler of insane violence to the impressionable young, 'coz I'm not. Nor does Andy Braybrook carry a gun, or Tony Crowther a machete.

Thank you, and goodnight.

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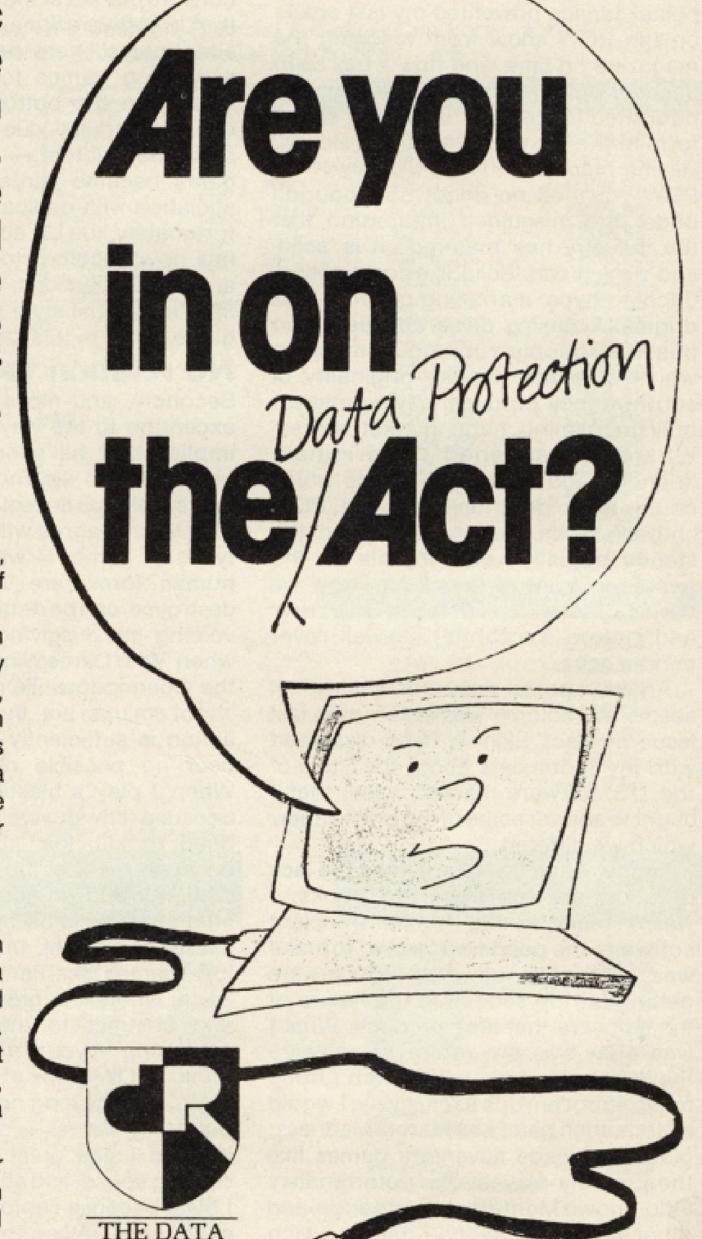
DATA PROTECTION

The 11th November 1987 was an important landmark in UK public policy. On that day the last of the provisions of the Data Protection Act 1984 were fully implemented. All the rights we enjoy under the Act are available, should we need to exercise them. Some of these rights are already in place, but the right see what is held on computer about oneself was not available previously.


Are you in on the Data Protection Act?
THE DATA PROTECTION REGISTRAR

Why a Data Protection Act?

Computers are in use throughout society — collecting, storing, processing and distributing information. Much of that information is about people (personal data).

The new Act gives new rights to individuals about whom information is recorded on computer (data subjects). They may find out information about themselves, challenge it, have it corrected or erased if appropriate, and claim compensation in certain circumstances. The Act places obligations on those who record and use personal data (data users). They must be open about that use (through the data protection register) and follow sound and proper practices (the data protection principles).

What the Act Covers

The Act only applies to automatically processed information — broadly speaking, information which is processed by a computer. It does not cover information which is held and processed manually — for example, in ordinary paper files.

The Act does not cover all computerised information but only that which relates to living individuals. So, for example, it does not cover information which relates only to a company or organisation.

Research undertaken by the Data Protection Registrar has shown that the public rates the protection of privacy (in a general sense) as a very important issue. It was ranked fourth in importance above freedom of speech, inflation, women's rights or minority rights and after crime prevention, unemployment and educational standards.

There is therefore a great deal of support for what the Act aims to achieve.

Every man, woman and child in the UK has new legal rights under the Data Protection Act. These rights cover access to one's own files, correction or deletion of inaccurate information, compensation for damage and associated distress and the right to seek redress through the Registrar.

The Right to Know

From 11 November 1987 any individual is entitled to be supplied by a data user with a copy of any personal data held about him or her. This is called the 'subject access' right.

The way to go about it is to write to the organisation concerned direct, making it clear that you wish to exercise your rights under the Act. Or you can consult the data protection register first to obtain more details about the data user. The register is held in microfiche form at the offices of the Data Protection Registrar in Wilmslow and in 171 main public libraries throughout the UK.

What is on the Register

Each entry shows the name and address of the data user, a description of the type of information held, how it is gathered and used and to whom it will be disclosed. It also shows where you can write to obtain a written or printed copy of your own records.

Fee Can be Charged

Data users are permitted to charge up to £10 for meeting each request but some may decide to charge less, or nothing at all. They will let you know the fee and if they need extra information to help them locate the data. They have up to 40 days in which to provide the data from the date of receiving adequate information. They may require proof of identity, to avoid disclosing the data to the wrong person.

Sometimes the right will not apply — for example, where giving subject access would be likely to prejudice the prevention or detection of crime.

If the data is not provided within the 40 days, the individual concerned can complain to the Registrar or apply to the courts for an order that the data user should provide access.

Compensation

A person who has suffered damage and any associated distress caused by the loss, unauthorised destruction or unauthorised destruction or unauthorised disclosure of information about themselves can seek compensation through the courts. Similarly compensation may be claimed for damage and associated distress caused by inaccurate data.

Correction or Deletion

If personal data is inaccurate, the individual concerned may complain to the Registrar or apply to the courts for correction or deletion of the inaccurate information.

Complaints to the Registrar

Anyone who considers there has been a breach of one of the principles or any other provision of the Act is entitled to complain to the Data Protection Registrar. If the complaint raises a matter of substance and is made without undue delay, the Registrar must consider it. If the complaint is justified and cannot be resolved informally, then the Registrar may need to use his powers to prosecute or to serve one of the notices mentioned in another article. In any event, when the Registrar has considered the complaint, he must notify the complainant of any action which he proposes to take. He is there to help the public and to protect their rights under this new Act.

Investigation Department
Office of the Data Protection
Registrar
Springfield House
Water Lane
Wilmslow
Cheshire
SK9 5AX

If You Are A User — Register!

Registration of data users — those individuals or organisations who hold data about living people on their own or someone else's computer — began in November 1985. Computer bureaux providing services which involved personal data also had to register. Data users and computer bureaux were given until 11 May 1986 to register and to have processed personal data after this time without having registered is a criminal offence.

In the event, around 110,000 applications for registration were made in the initial period. A steady flow of subsequent applications brought the total number received to 136,000 by the end of August this year. This remains well below the original estimate of 250,000 to 300,000 although it is in line with experience in other European countries. The Registrar's investigation and enforcement team are already seeking unregistered users and once the public can ask to see their own records, this will also help to identify unregistered users who will then face prosecution.

Getting the Wrong Idea

Research undertaken earlier this year showed that a third of small business computer users were still unaware of the Act. 43% of those who had heard of the Act nevertheless believe that it did not apply to them — the main reason given was that they held no 'personal data'. The Registrar is concerned that these responses suggest a misunderstanding by smaller businesses of the coverage of the Act and definition of 'personal data'. Personal data tends to be misinterpreted as being of a highly sensitive nature such as physical disabilities or marital complications.

In fact it can be as simple as someone's name and address.

The Data Protection Principles

Registered data users must comply with the data protection principles in relation to the personal data they hold. Broadly they state that personal data shall be:

- collected and processed fairly and lawfully,
- held only for lawful purposes described in the register entry,
- used only for those purposes and only be disclosed to those people described in the register entry,
- adequate, relevant and not excessive in relation to the purposes for which they are held,
- accurate and, where necessary, kept up to date,
- held no longer than is necessary for the registered purpose,
- protected by proper security.

The principles also provide for individuals to have access to data held about themselves and, where appropriate, to have the data corrected or deleted.

Registrar's Task To Make It All Work

The Data Protection Registrar, Mr Eric Howe, is an independent officer who is appointed by the Queen and who reports directly to Parliament. He has a permanent staff of around 60 people. His duties are to:

- establish the register of data users and computer bureaux and make it publicly available;
- spread information on the Act and how it works;
- promote compliance with the data protection principles;
- encourage the development of codes of practice to help data uses to comply with the principles;
- consider complaints about breaches of the principles or the Act and,
- where appropriate, prosecute offenders or serve notices on registered data users and computer bureaux who are breaking the principles.

Who Is Exempt?

There are a number of exemptions under the Act.

One example is where personal data held by an individual is used only for the management of his or her own personal, family or her own personal, family or household affairs or for recreational purposes. Another is where information is required by law to be made available to the public — such as in the case of shareholders' registers or electoral registers. Yet another exemption is where national security is involved.

Payroll, Pensions and Accounts

Data held purely for payroll, pensions and accounts purposes are also exempt, but there are very strict conditions. In the vast majority of cases this information is also used for personnel records or marketing purposes and consequently is not exempt.

Personal data held by an unincorporated members club, which only relate to its members, are exempt from the whole of the Act, so long as two conditions are observed.

First, all members of the club must be asked whether they object to their details being held on computer by the club. If a member objects, then his or her details must be taken off the computer.

The second condition is that personal data about members may only be disclosed in certain limited circumstances. For example, it may be disclosed if the member concerned requests it or gives consent, but could not be disclosed for example to an outside maintenance engineer without a member's consent.

Personal data held only for distributing or recording the distribution of articles or information can also be exempt, but similar conditions apply.

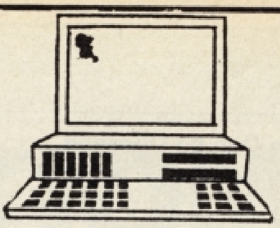
Subject Access Exemptions

There are also a number of exemptions frmo the need to provide information where individuals are seeking to exercise their 'subject access' rights. Some examples of where personal information may be withheld are where this would prejudice:

- the prevention or detection of crime,
- the apprehension or prosecution of offenders,
- the assessment or collection of any tax or duty.

That is not to say that the police, for example, do not need to register. They do, and their decision to withhold information can be challenged by the Registrar on receipt of a complaint from a member of the public.

CBS COMPUTERS



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VALUEWORD

"Who's going to buy a £9.99 disk-based C64 word processor," I asked myself when this little number from American publisher Melody Hall hit my doormat. If you own a Commodore 64, a disk drive and a printer, the chances are that you already have a word processing package amongst your software collection.

So, although I started to make a list of all the things ValueWord doesn't do, it seems more sensible to concentrate on what it does. After all — what you've never had you'll never miss, will you?

The instructions are no more than about 250 words to cover loading and operating. On the disk, however, a more comprehensive operating manual in the form of a ValueWord document. You load the program, then the user file "INSTRUCT", then you print it out and, hey presto — a user manual to keep and cherish. The four pages of printout give a pretty good guide to the use of ValueWord and are perfectly adequate. For instant reference, the program also contains an on-screen "help" feature which can be accessed at any time to check on the various functions available.

Wordwrap

The format of the text can be altered using what the instructions call a "checkmark", and is produced by pressing the left arrow key at the top left of the keyboard. It needs to be on a separate line and followed by two figures divided by a comma. The two figures represent the left margin and the line length — so if you have an 80-column printer and want a ten space margin at either side, you enter 10,60.

ValueWord has a "wordwrap" feature. What this means is that the program doesn't break words up if they happen to be typed at the right hand side of the screen. Instead, the whole of the word is moved down to the next line. It has a status line which indicates the position of the cursor in terms of page number, line number and column number. You can set tabs. You can dodge about the text with single key instructions to save a lot of scrolling. You can save your document to disk or you can print it out. You can load a previously saved document. You can view the directory of the disk in the drive. You can reformat your text (so you can type in 40 columns but print in 80). And you check your spelling against ValueWord's built in dictionary.

The dictionary contains 40,000 words — or so claims the blurb on the packaging. When the program is asked to spellcheck the document, it sorts all the words into alphabetical order before prompting you to insert the program disk. It then compares each word against the contents of its dictionary and deletes them from the list if it finds a match. The words left over are then highlighted in turn in the document and you are given the option of correcting the word or accepting it. This is not a rapid procedure — checking this document so far took six and a half minutes and the wretched thing didn't find time to count the words while it was at it. Neither is it infallible. The ValueWord dictionary appears to accept all single letters, which means it won't spot where you hit the S instead of the A, for instance. It's a very useful feature to have and one you wouldn't expect to find in a £20 program, let alone a £10 one.

'ValueWord is well-named'

Printing from ValueWord is done via the serial bus. If you have a Commodore printer, this is what you would do anyway. If you've invested in a printer with a parallel interface, you'll need a hardware device. ValueWord offers a number of options: you can alter the printer secondary adress; you can have the pages numbered automatically (starting at any number up to 250); you can have justified text; you can have double spacing; you can choose sheetfed or continuous stationery (although I couldn't find a way of changing the form length) and you can have standard ASCII output if that's what your printer/interface insists on.

Included on the disk in addition to the ValueWord program, the dictionary and the intructions are four documents which purport to be guides to Spelling, Punctuation, Salutations and Letter Formats. There are errors in the Spelling and Punctuation documents so print them out once for a giggle and then ignore them.

ValueWord is well named. At the price, I don't think you can do better. It's reasonably fast, reasonably flexible, robust and useable. The user is protected from making too many howlers by "are you sure" type stages in the operation. My only serious complaint about the program is that there is no way of accessing disk commands. You cannot, therefore, format a disk without exiting ValueWord nor can you scratch files from an existing data disk. Since ValueWord does not allow you to resave a file under the same name, you have to think up a string of different names if you intend saving your work at regular intervals.

If you have an occasional need for a word processor and don't want to part with too much cash for the privilege, ValueWord could well be the one for you.

T.L.

Contact: Electric Distribution, 8 Green Street, Willingham, Cambridge CB4 5JA. Tel: (0954) 61258.

VIDEO KILLED THE MICRO STAR

Whatever happened to that fascinating scenario that saw the TV set moving into the centre stage of family life, aided and abetted by computer technology? According to the pundits writing at the turn of the decade, by now our TV sets should be the central display consoles for a complete information-gathering, decision-making, opinion-polling entertainment system. Despite the predictions, the television set in most households today still finds its primary use in relaying Coronation Street and Top of the Pops to a mass audience. Graeme Kidd wonders why...

When you add it all up and put it into context, the output of the British home computer entertainment software 'industry' is very small beer indeed. Playing computer games is, in reality, a minority interest and very much an anti-social activity. Alan Sugar, whether he realised it or not, capitalised on the anti-social nature of home computer when he provided the CPC range of machines with their own built-in monitors. No longer did the family TV have to be hi-jacked for the latest round of Ghosts and Goblins or spreadsheet analysis.

Few computer games require two or more players, and most of the socially interactive aspects of computer game playing involve talking to people who share your interest in the closed world it forms. Playing techniques, high scores, solutions to tricky puzzles in adventure games along with the latest developments in music, graphics or hardware are all discussed in the playground or the pages of computer magazines. And that's about as wide as the debate ever gets. Ideas for games are licensed in from the outside world of TV, books and films — so, far no-one has managed to create a character on computer and license it out to other industries.

Being entertained by a computer, whether by elegant applications packages, by cunning code or stunning gameplay is not a mass pursuit. Face the facts and accept the reality. How many people visited the Personal Computer World Show this year — the biggest ever? How many people saw David Bowie last time he was in concert in the UK? What is the weekly audience for Coronation Street or the News of the World? Compare and contrast with the monthly audience for all the computer magazines published in this country. Get the picture...

Back to the Information Revolution. Sure, some people invest in TV sets capable of receiving Ceefax and Oracle and no doubt many people regret spending the extra money. Is the additional cost of hardware really justified by the ability to look up the latest cricket scores, or call onto screen tonight's viewing schedules? Not really, while radio, newspapers and the new breed of phone-in information services can offer more information, more conveniently. Subtitling TV programmes is the only really useful application for Teletext, an application too underused to be of major benefit to the deaf or hard of hearing.

D Popular Service

Prestel, then. There's a really huge database, crammed with information, advice and purchasing opportunities. Unfortunately, the Powers That Were when Prestel was set up decided that people should have to buy the hardware needed to access the service, then pay a subscription to gain access, then pay for many of the pages accessed as well as fork out for the telephone call needed to link the user to the host computer. Most ordinary folk don't have a strong enough need for information to warrant spending a lot of money of accesssing it, so Prestel moved away from being a general purpose, mass information distribution service. The majority of subscribers were businesses who wanted to set up closed user groups or provide specialist commercial information for which other businesses were prepared to pay. Until Micronet came into being, this is.

Micronet is currently the largest information provider on Prestel, enjoying phenomenal success in terms of page accesses. It is Micronet that is doing the innovative work, providing interactive games and other entertainments within the limitations of the Prestel format, but Micronet was set up for home computer users. Only a tiny minority of the population accesses Prestel, even via Micronet.

In France, the policy makers were a little more far-sighted, dishing out the terminals needed to access the French equivalent of Prestel for free, thus encouraging the mass of ordinary people to use the service. Significant extra revenue to pay for this investment and the viewdata service comes from all the extra telephone calls these ordinary people make. France's Minitel has become a popular service that does not rely on home computer owners for mass appeal...

So it is not the home computer, nor is it Teletext or Viewdata equipment that is connected to the British television set. It is the video recorder. Hardly surprising really, when the systems have been set up so that a family can rent a video recorder for a few pounds a week and then rent films, which the whole family can watch together, for a pound or two a night.

Compared to home computers, video had it easy. There were only three formats commonly available and these rapidly distilled down to one standard — VHS. The software was expensive, with a video film costing between £50 and £100, so the budget approach was soon adopted nationwide — film rental became the order of the day. And video arrived at a time when the cinema was in decline outside cities — a walk to the local shop where there were racks of movies for hire became a cheaper and easier alternative to travelling to a cinema to watch a movie. People were familiar with the concept of taping sounds and playing them back, so no conceptual jumps were needed to grasp the idea of taping and playing back sound and pictures — you didn't have to understand how it worked to operate the equipment and techno-fear didn't come into it.

Home computers arrived in their droves in the early Eighties, and the choice faced by the consumer was a confusing one. Nowadays, things have settled down to three 8-bit entertainment machines and the ST and Amiga, but there's still a significant number of people plodding along with C16s and Electrons. MSX came too late in the day to form the basis of a unified, single-format home computer entertainment industry and too many interests had become vested by the time it arrived. Video won the day.

Perhaps the pundits who preached about the dawn of the micro revolution did more harm than good, frightening people by the enormity of the possibilities and making the choice between home computers even more daunting. Whatever the cause, home computers have not yet achieved the central position in people's lives that many people predicted and that most people in the 'industry' might like to believe.

G.K.

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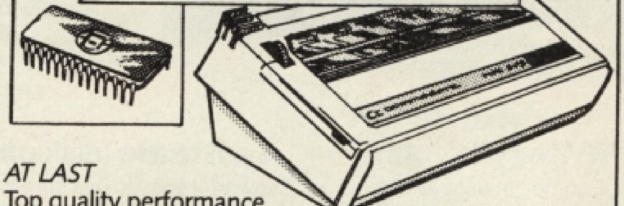

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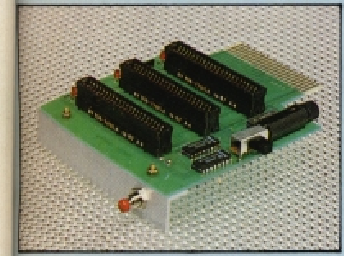

3 SLOT MOTHERBOARD

Save wear and tear on your Expansion Port

☐ Accepts 3 cartridges. ☐ Onboard safety fuse.
☐ Switch in/out any slot. ☐ High grade PCB.
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☐ Quality Commodore compatible data recorder.
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☐ Counter. ☐ Send now for quick delivery.

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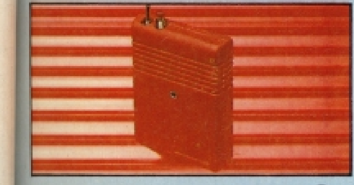

SMART CART ™

Now you can have an 8K or 32K cartridge that you program like RAM then acts like ROM!

☐ 8K or 32K pseudo ROM.

☐ Battery backed to last up to 5 years (lithium battery).

☐ Simply load the program you require – then flick the switch. The cartridge can then be removed just like a ROM cartridge.

☐ Make your own cartridges including autostart types – without an EPROM burner.

☐ Can be switched on or off board via software.

☐ I/O 2 slot open for special programming techniques.

☐ 32K version has 4 x 8K pages.

☐ Some knowledge of M/C is helpful – but full instruction are provided.

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32K VERSION £29.99

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A series of utility programs for use with Smartcart. Simply load in the program and you have a powerful cartridge. When you have a different requirement – load in another program and you have a new cartridge. The process takes seconds, and can be repeated any number of times.

We intend to release a range of programs. The first available are:

DISKMATE II

☐ all the features of Diskmate II (see ad). Loaded in seconds – with full instructions. **ONLY £9.99**

PRINTER IV

Now you can turn your MPS 801 into 4 printers in one!!

☐ Alternative character set ROM – fitted in seconds.

☐ All four sets have true descenders.

☐ 100% compatible with all software.

☐ Descender. ☐ Eclipse.
☐ Scribe. ☐ Future.

☐ Choose any set at the flick of a switch.

"For anyone who uses their printer often this chip is a must. It's quick and easy to use and the end results are impressive" – Your Commodore, Jan 87.

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Turbo Rom II is a replacement for the actual kernal inside your 64. It provides superfast load/save routines.

☐ Loads most programs at 5-6 times normal speed.

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☐ Improved DOS support including 10 sec format.

☐ Programmed function keys:- load, directory, old, etc.

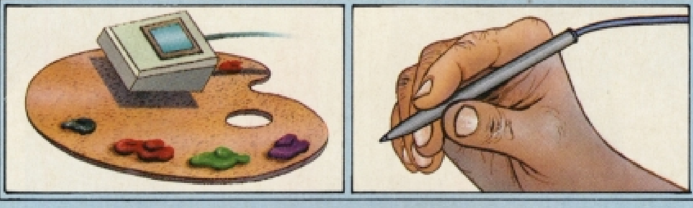
☐ Return to normal kernal at flick of a switch.

☐ FCOPY – 250 block file copier.

☐ FLOAD – special I/O loader.

☐ Plus lots more.

☐ Fitted in minutes – no soldering usually required. (On some 64's the old ROM may have to be desoldered). **ONLY £14.99**



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A complete lightpen/graphics illustrator package.

☐ A fully icon/menu driven graphics package of a calibre which should cost much more.

☐ Complete with a fibre optical lightpen system for pin point accuracy.

☐ Multi feature software including:
● Range of brushes ● Airbrush ● Rectangle ● Circle ● Rubberbanding ● Lines ● Freehand ● Zoom mode ● Printer dump ● Load/save ● Advanced colour mixing – over 200 hues!! ● Cut and paste allows shapes/windows/pictures to be saved to/from tape/disk.

☐ Blazing Paddles will also work with many other input devices including: Joysticks, Mice, Graphics Tablets, Trackball etc.

☐ Pictures can be saved from Action Replay and edited with Blazing Paddles.

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Blazing Paddles available separately for **£12.99**

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The ultimate disk toolkit for the 1540/1541

☐ A disk toolkit is an absolute must for the serious disk hacker. Toolkit IV has more features than most for less.

☐ DISK DOCTOR V2 – Read and write any track and sector including extra and renumbered tracks. Repair damaged sectors. Look underneath read errors.

☐ HEADER/GAP EDITOR – Decodes and displays ALL header information including off bytes and header gap. Rewrite the entire header and header gap. Renumber sectors. Also edit any sector tail gap.

☐ DISK LOOK – Sort directory. Recover lost files. Display file start/end addresses. Disassemble any file program directly from the disk to SCREEN or PRINTER including undocumented opcodes. Edit Bam. Much, much more.

☐ FILE COMPACTOR – Can compact machine programs by up to 50%. Saves disk space. Compacted programs run as normal.

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☐ FORMATTER – 10 second format an entire disk or format any individual track or half track 0 to 41. Redefine any of 30 parameters to create or recreate unique disk formats.

☐ ERROR EDIT – Quickly find and recreate all read errors including extra and renumbered tracks or sectors and half tracks from 0 to 41. Even recreates data under errors and allows you to redefine any necessary parameters.

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☐ Turn your Smart Cart into a 32K RAM/disk.

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☐ Load/save instantly.

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☐ Program data retained when computer is switched off!

☐ Full command set with instructions. **ONLY £9.99**

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☐ 4 output channels – each with onboard relay

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☐ Software features:- test mode/analogue measurement/voice activate/digital readout etc.

☐ Excellent value! **ONLY £39.99**

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☐ The new sampler allows you to record any sound digitally into memory and then replay it with astounding effects.

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☐ Powerful sequencer with editing features.

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☐ Com-Drum software is available separately at **£9.99** to turn your Sampler II into a Com-Drum system as well as a sampling system.

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☐ Now you can turn your computer into a digital drum system. ☐ Hardware/software package.

☐ 8 digital drum sounds in memory at one time.

☐ Complete with 3 drum kits.

☐ Real drum sounds – not synthesised.

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- ☐ 8 sockets to accept upto a 32K EPROM in each.
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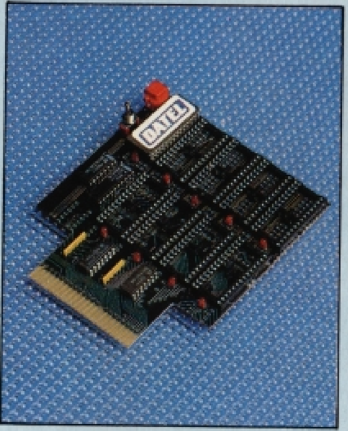

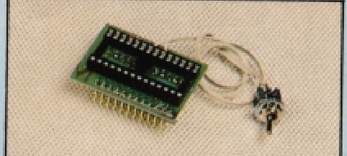

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- ☐ This board fits in place of the kernal in your 64 and accepts a 16K or 32K replacement kernal giving 2 or 4 different operating systems.
- ☐ Just flick the switch supplied to select between systems.
- ☐ This is a carrier only – ready to accept your own chip.
- ☐ Now you can have all your different systems available at one time.
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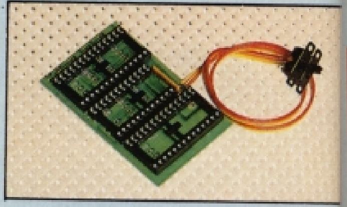

5 WAY KERNAL EXPANDER

- ☐ A multi carrier board accepts up to 3 chips.
- ☐ Fits in place of original kernal of 64.
- ☐ Three sockets – one for the original kernal plus two others each accepting a 16K chip – that's 5 operating systems available at the flick of a switch!
- ☐ Fitted in minutes.
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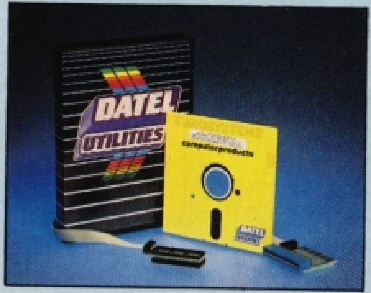

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- ☐ The most powerful disk nibbler available anywhere, at any price!
- ☐ Burst Nibbler is actually a two part system – a software package **and** a parallel cable to connect the 1541/1570/1571 to 64/128 (state type).
- ☐ What gives Burst Nibbler its power? Conventional nibblers have to decode the data from the disk before it can transfer it using the serial bus – when non standard data is encountered they are beat. Burst Nibbler transfers data as raw GCR code via the parallel cable without the need to decode it so you get a perfect copy of the original.

- ● Will nibble upto 41 tracks. ● Copy a whole disk in under 2 minutes. ● Full instructions.
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- ● Full or ½ tracks. ● No need to buy parallel cable if you have Disk Demon/Dolphin etc.
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- ☐ Whether to choose FastHack'em or Burst Nibbler? Fast Hack'Em is unbeatable value as an "all-rounder" – with nibblers, 1 or 2 drive copy, format, file copy, 1571 copy etc. etc., so if you have a more general requirement perhaps FastHack'Em is for you. Burst Nibbler is a pure nibbler second to none, for the reasons stated. So if it's just making backups you are interested in, there is no other product to beat it.

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- ☐ Fully menu driven software/hardware package makes programming/reading/verifying/copying EPROMs simplicity itself.
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- ☐ Full feature system – all functions covered including device check/verify.
- ☐ We believe Eprommer 64 is the most comprehensive, most friendly and best value for money programmer available for the 64/128.
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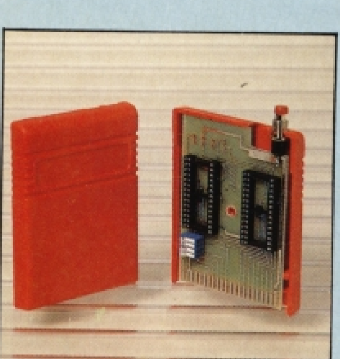

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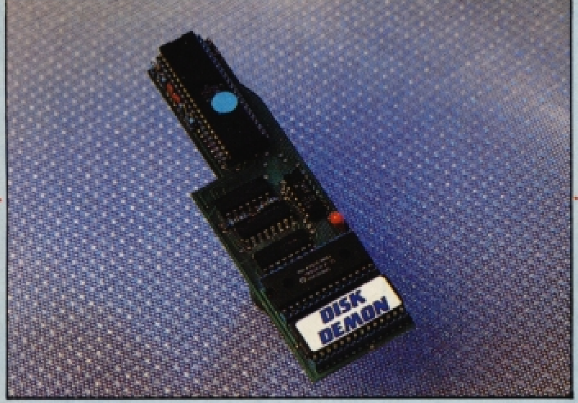

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- ☐ Unique built in file copier will copy files up to 250 blocks like lightning – multiple copy options – perfect for copying Action Replay files.
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- ☐ Supplied complete with all cables – no more to buy.
- ☐ This drive is now probably the most compatible drive available for the Commodore. More so than even Commodores own '1541C. Much more so than other so called compatibles. In fact we have been unable to find a program including the latest that would not work. (At time of Press).
- ☐ **No need to look elsewhere – this is the best.**

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- ☐ Powerful toolkit commands including: old/delete/merge/copy/append/autonum/linesave etc.
- ☐ Plus a full machine code monitor – too many features to list but it has them all!
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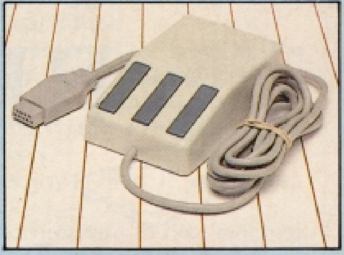

MOUSE

- ☐ CBM 64/128 mouse.
- ☐ Wide compatibility with software including: Blazing Paddles.
- ☐ Works by mimicking joystick so will work in any joystick application including graphic packages only designed for joystick.
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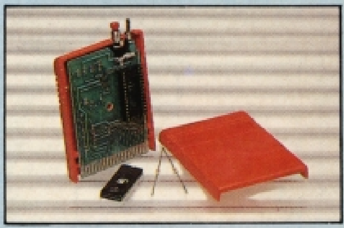

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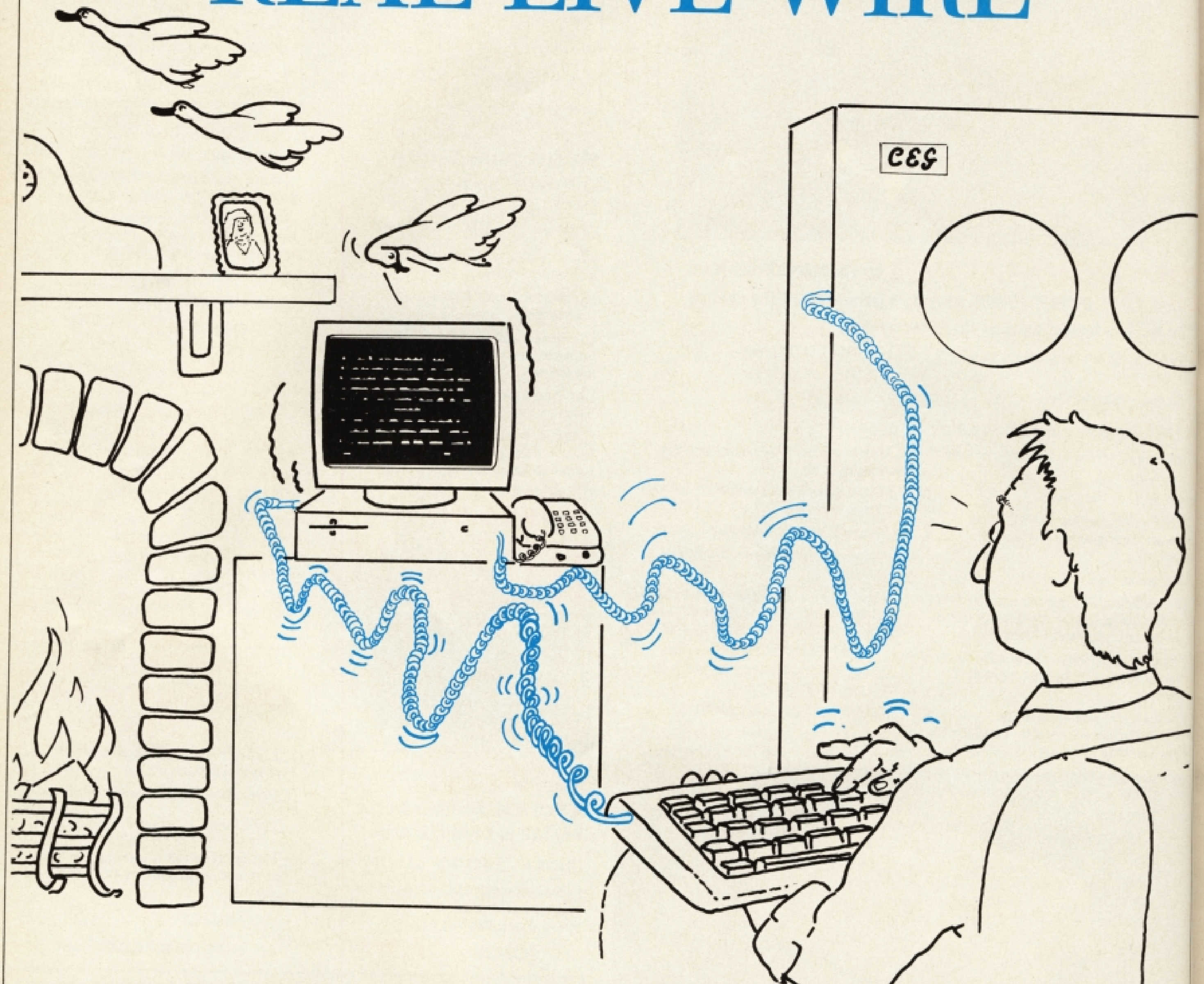

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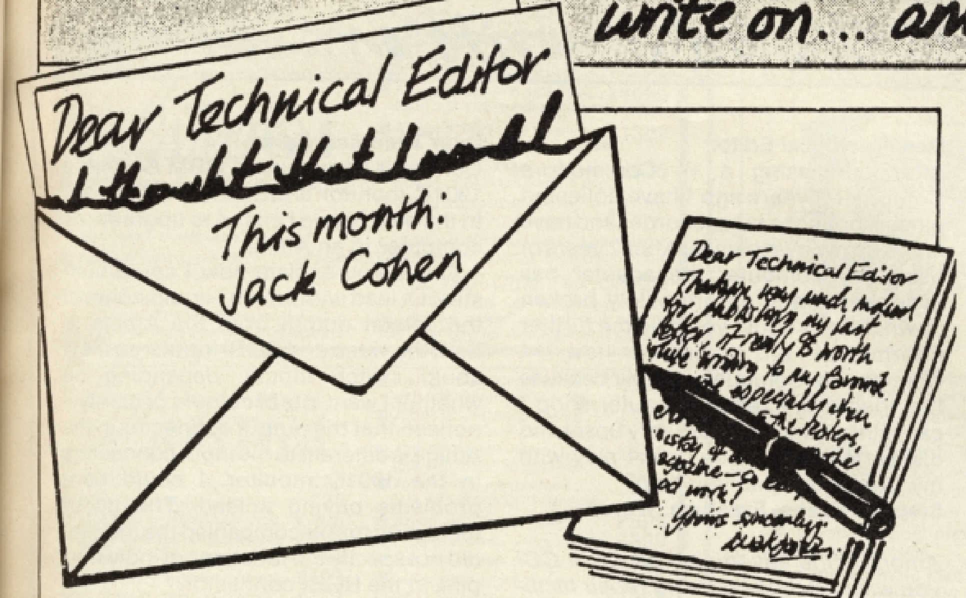

Dear Technical Editor
~~I thought that I would~~
This month:
Jack Cohen
Dear Technical Editor
Thank you very much indeed for publishing my last letter, it really is worth while writing to my favourite ... especially ... editors, ... good work!
Yours sincerely

Dear Technical Editor
Can you please help me I have a 1541 disk drive and would like to get a new belt for the drive, also can you tell me the type of Zener diode used in the 1541 drive.
D. Mullan, Nottingham

Try HRS of Birmingham on 021-771 2525 for drive belts for the 1541. You have not specified the circuit reference (printed on the PCB) for the Zener diode.

There are more than one type of these diodes although they all look alike. The most common is type BZY88 but exercise care with them.

As an example of the difficulties that can happen is that of the diodes on the supply side.

Early CBM disk drives could accidentally erase diskettes if power was turned on or off with the diskettes in the drive.

A diode in the power supply circuit provides power down protection which prevents the above fault from occurring. Diodes should not normally need replacement.

Dear Technical Editor
Please help me! I want to write an icon driven database for my '64C. I want to read the NEOS mouse which comes with the '64C, but the address on the box is in Japan and the 2 page instructions don't say anything.

I can write the code, but can't read the rodent! Do you know how to?
V. Turner, Telford, Shropshire
P.S. Your book doesn't say either!

There are two ways of approaching this task.
1. If you have a mouse designed along Joystick lines with 8 directions then use the code for reading joysticks — in most good 64 books.
2. Find out from where you purchased the Mouse if they now have a Mouse driver which is a machine code routine written to control the Mouse for use in appropriate programs.

Dear Technical Editor
With reference to your reply to Simon Bore's letter (November issue) on the easiest way to delete the ? prompt after an input command.

The best method I use is POKE21,1 (C128) or POKE19,1 (C64). These pokes delete the ? prompt and move the cursor back one space, so you must remember to add a space before you close quotes in your screen prompt message ie 10 INPUT"ENTER YOUR NAME ":N$.
If not the first letter of text typed in will be displayed immediately after the "E" in name. It doesn't have to be a space, a colon ":" or a ">" will look more professional on screen.
P. Shaw, Lancs.
PS When are you going to write 'Programming the Commodore 128'. Your books are fast becoming like the 'James Bond' movies 'eagerly awaited never disappointing'.
PPS Now I've inflated your ego can I have a free one please!

Some extra information about the suppression of the INPUT prompt is given by the above reader. (ref NOV 87 CCI answer to Simon Borg).

He uses POKE 21,1 for the 128 and POKE 19,1 for the 64.

Both of which require a space or alternative prompt character before the closing quotes in the INPUT message.

However he does not mention that to avoid suppression of line feeds one has to program as follows:—

```
10 POKE 21,1
   20 INPUT"Enter your name ";n$
30 PRINT
40 POKE 21,0
50 PRINT "HELLOW ";n$
```

I still think RAE's method is simplest.

Dear Technical Editor
Recently I ventured to type in the Program MENUGEN (CCI May). Having done so and only having two data errors and one syntax I had the Program to run quite effectively.

I was over-joyed that it worked so well.

I saved the program to disc twice to ensure that I wouldn't lose it. To my dismay however when I loaded it back from disc and ran it all I had was a cold start.

Could you explain why this happens and if there is a remedy.

Also — I've got a merge program from the book THE WORKING COMMODORE, but the program only refers to tape. Would you please tell me where I can get a MERGE program for disk.
Warren (Evans), Garngoch, Glamorgan

There is a rule you must follow when typing in CCI programs.

SAVE the program before RUNning it!
Especially with Basic programs that poke data into memory to create an executable machine code routine.

The Basic program may be corrupted by this process.

'Syntax error' when executing a machine code routine usually indicates an incorrect exit from the routine into Basic.

If you have a machine code monitor then the best way to use the routine is to RUN the program then enter the monitor and type S "0:menugen", 08, c29d, c566" then RETURN.

c29d is the hex equivalent of 49821 dec and c566 is hex equivalent of 50533 + 1 Turn off your 64 then turn on and type LOAD"0:menugen,8,1.

Load your basic program (with the call to menugen in it) and then RUN.

To merge two or more SEQ files use the copy command. e.g. OPEN 15,8,15.
PRINT#15, "c0: combined=0: file 1,0: file 2,0:file 3":CLOSE 15

To merge (append) subroutines etc to Programs:- make sure that line numbers in each program do not overlap.

The easiest way is to first enter POKE 43, PEEK (45)-2:poke 44, peek (46) in direct mode. If Peek (45) is 0 or 1 then enter instead POKE 43, PEEK (45) + 256-2:POKE 44, PEEK (46)-1.

Load the program to be appended and then POKE 43, 1:POKE 44,8.

Now you can save the combined program.

Dear Technical Editor
Thank for the data tip it worked perfectly, I have added it to my new computer game WAR!!! I've used it to read all the different cities. I haven't had an OUT OF DATA ERROR yet.
THANKS
Jo Gardner London

Always pleased to be of help! *CCI*

and on... write on... and on... write on... and on...

Dear Technical Editor

I have a Commodore 128 D and recently bought an additional disk drive, a 1541, to facilitate the use of the 128 Partner that I have. However, I have not yet hooked it up to my system for two reasons. Firstly, I am not now certain whether an additional disk drive is worthwhile for someone who does no programming and only uses commercial programs; and the other reason is that I have heard that if you accidentally have both drives with the same device number you can do serious damage to the computer itself. Although that is a problem that one should be able to avoid it is another doubt I have to contend with!

Could you please tell me the best way to take advantage of a second drive when using commercial programs?

The other thing on which I would appreciate your advice is on the use of memory expanders for the 128. I do not know of any programs that have come out yet written specifically for the memory enhanced 128, but maybe you know of some, or some that are in the pipeline? My particular interest is in a spread sheet program; I am using the Multiplan 64 at the moment.

Finally, the memory expansion modules are more readily available, I believe, in the States than in the UK. I am wondering whether an expansion module bought there where the voltage and frequency are different to the UK and Spain where I live, could be used in a 128 on the 240v grid? I have been assuming that the transformer built into the 128 provides the same voltage to the computer regardless of the input voltage. Or am I wrong?

C. J. Matthew, Alicante, Spain.

A second drive is useful to speed up the copying of files and the use of one is usually provided for as an option in good commercial programs in the start up menu.

The drive number can be changed (until reset) in software (before loading your commercial program) by typing in the following program.

```
10 OPEN 15,8,15
20 PRINT#15, "M-W" CHR$ (119) CHR$
(0) CHR$ (2) CHR$ (41) CHR$ (73):
CLOSE 15
```

Do not switch on your 1541 until you have RUN this short program.

The device number of the built in drive will be '9' and then switch on the 1541 which is '8'.

If your software requires a 1571 drive to load on then LOAD "★", 9 should work. Full details on memory expanders for C128 were given in CCI June 87 issue on pages 34 and 39.

Copies still available.

No extra power is required for C128 expander cartridge.

Dear Technical Editor

After purchasing a +4 Commodore Computer 2 years ago I have collected games, bought a tape recorder and have made up my own games. After 2 years of using my computer the adapter has over heated and unfortunately broken down. Please could you give me further information on buying a new +4 Commodore Computer adapter because I've tried every retail computer shop I can think of and now I am very upset and disheartened because I can't play with my Computer. Can you help?

Stephen Crane, Evesham, Worcs

Amongst the advertising pages in CCI you will find those offering repair facilities for +4 and other CBM computers.

Phone them for a quote for a replacement power supply but you will probably have to pay anywhere between £17.50 and £25.00 for one.

Dear Technical Editor

Thank you for an excellent magazine. Please could you help me with some information concerning a certain printer.

I hope soon to purchase an Amiga 500 and software pack.

I would like to know the following details concerning the OLIVETTI DM105 COLOUR DOT MATRIX PRINTER, which is available from DIMENSION COMPUTERS:-

1. How many colours has the printer.
2. Does it need a printer driver to work on the Amiga 500.
3. Is it sent with a Amiga-Centronics cable.
4. WHERE can I obtain spare ribbons for this printer?
5. What colour is the printer and what are its sizes?

Please, please answer my questions.

Mr. C. P. Arm, Hants

1. *The printer has a 4 colour ribbon which can be combined to print 7 colours and a large (almost infinite) number of shades.*
2. *No — driver is built into the printer rom*
3. *yes*
4. *availble from Dimension Computers at £19.95 for a SEVEN MILLION strike one.*
5. *A darker grey than the Amiga — Height 3.7" — Width 15" — Depth 10".*

JACK COHEN IS A LEADING MEMBER OF ICPUG THE INDEPENDENT COMMODORE USER GROUP.

Dear Technical Editor

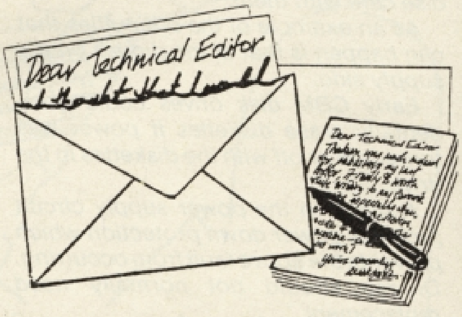
Currently I am using a CBM 64 with a 1901C monitor and Star NL-10 printer. In the near future I intend to upgrade my computer to an Amiga.

Could you explain how I could construct a lead with which I could connect the screen output from the Amiga to both the video and RGBI inputs, so that I could switch inputs, depending on whether I want lots of colours or clarity. I noticed that the output connector in the Amiga is different to the input connectors in the 1901C monitor. I could have problems buying a lead. The documentation that accompanied the monitor did not specify the functions of individual pins in the RGBI connector.

Secondly, is it possible to use the Star NL-10 with a Commodore-type serial interface, with a centronics printer output from the computer by using a special lead? It seems wasteful to discard the serial interface and purchase a centronics interface if the former can be made to work.

Perhaps you could answer these questions in the form of an article.

The 1901 monitor can be converted to use with the Amiga by Trilogic for a small outlay. See their advert in our December issue on pages 14 and 43. The Star NL-10 can be used frm the Amiga via the user port of your 64 by buying the Amiga-64 Printlink (see December issue page 6).



Competition Winners

Winners for the Evesham Excelvator Competition.

Overall Winner:

Andrew Tate, Whitley Bay.

Runners-up (each receive a Slimline 64 case)

Paul Jobson, Bucks; J. R. Brown, Surrey; W. Findley, Ayrshire; Mr. D. M. Thornton; L/Cpl Davis, BFPO106; Martin Lippe, West Germany; Aarif Janmohamed, E. Africa; Claus Nielsen, Denmark; Paul Rayson, Birmingham.

Citizen 1200 Competition Winner

Mark Sutton, Staffs.

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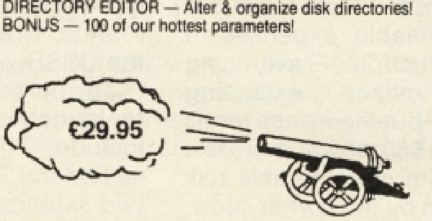

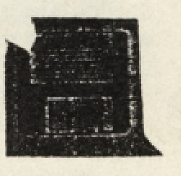

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SATELLITE COMMUNICATION Coming Down to Earth Fast

After years of repeated setbacks in the commercial satellite communications market, today's participants are carefully reviewing their options to determine if satellite communications has a commercial future. The setbacks they have experienced include:

— The continued loss of hundreds of millions of dollars by Satellite Business Systems and its investors;

— The loss of numerous satellites during launch, escalating insurance premiums to 20% or more of satellite constructions costs;

— The loss of the space shuttle Challenger and withdrawal of NASA from commercial launch activity, leaving the US without its own launching facilities;

— Widespread reports of a glut of transponder capacity with near-ruinous predictions for the future;

— The disbanding of ZapMail;

— The difficulties in utilizing satellites for data transmission with IBM protocols;

— The loss of substantial telephony revenues as a result of more favourable economics and performance using optical fibre; and "These setbacks," according to Ken Bosomworth of International Resource Development Inc., a US-based market research firm, "are causing satellite procurers to take a closer look at whether they want to participate in this market." Bosomworth was the project manager for IRD's newly-published 246-page research report on the future of satellite communications. The study looks at both the demand and the supply sides of the market.

"The barriers to entry and exit in this market are already incredible yet seem to be mounting each year," says Bosomworth. "Now there are not only formidable expenses in satellite construction — averaging around $60 million, excluding launch costs — but insurance terms are making this $60 million more like $72 million, with considerable risk still undertaken by the owner. Now, with the curtailment of voice traffic and use of satellites for telephony primarily a backup function, the risk of obtaining sufficient revenue to offset costs is increased. This is exacerbated by an extremely uncertain launch picture. Furthermore, once launched, you are more or less stuck in the industry for the lifetime of the satellite."

The lifetime of satellites is increasing, which is complicating the picture even more. Currently, the lifetime of a satellite is determined by the amount of usable fuel on board for the satellite positioning rockets. Comsat recently announced a minor alteration in the orientation of the spacecraft to allow for a slight drift, which is one possibility for extending the fuel life of the satellite.

Fairchild has proposed a shuttle-launched vehicle for in-orbit satellite refuelling. The implications are a potential need for *no* new satellites, assuming that advances in satellite technology are not so rapid as to make an original fuel supply fit exactly with the period preceding the obsolescence of the satellite.

Launchpads

After six years of encouraging investment by the private sector in commercial space ventures, the Reagan Administration pulled the plug on government-subsidised commercial launches. While leaving the US without a commercial launch vehicle, this move also puts potential launchers such as Martin Marietta at a disadvantage with the government-subsidised launch programmes of other countries, such as French-subsidised Ariane. With American technology clearly up to the challenge, it is still not clear that it can compete against Japan, France, Britain, and perhaps even the USSR.

The participants now on the hook for launches, or sitting on the fence, include:

— Federal Express, which planned two satellite launches for use with its ZapMail campaign;

— Martin Marietta, which may be a new satellite owner as well as launcher, using its own Titan rockets to put up two satellites as early as 1991;

— IBM;

— GET, with plans for at least two additional spacecraft;

— Ford, which has announced that it probably will not launch the three satellites it had earlier planned;

— Contel ASC, which had three satellites planned for shuttle launch but will probably postpone at least two indefinitely, in view of its new focus on optical fibre networks;

— General Electric/RCA, which will launch a Ku-Band satellite, probably not before 1988;

— Hughes, which hopes to add Ku capacity by 1990; and

— Comsat, still dedicated to the satellite industry, but cancelling plans to build three.

Silver Lining

Although the market for satellite services is beset by problems and populated by an increasingly puzzled group of vendors, there are substantial opportunities to be grabbed, according to the IRD report. The report points to several important vertical markets as likely to exhibit continuing growth and traces opportunities for entrepreneurs to acquire written-down satellite assets at bargain prices, then turn around and offer profitable services. According to Bosomworth, "The major changes which have taken place recently in the ownership of satellite service companies are likely to bring additional opportunities for companies which can relieve the new owners (including GE, IBM and soon, perhaps, General Motors) of satellite assets they don't want."

Further details on the ($2,300.00) report: Satellite Communications Services & Equipment Markets, Contact: IRD, 21 Locust Avenue, Suite 1C, New Canaan, CT 06840 USA. Tel: (203) 966-2525.

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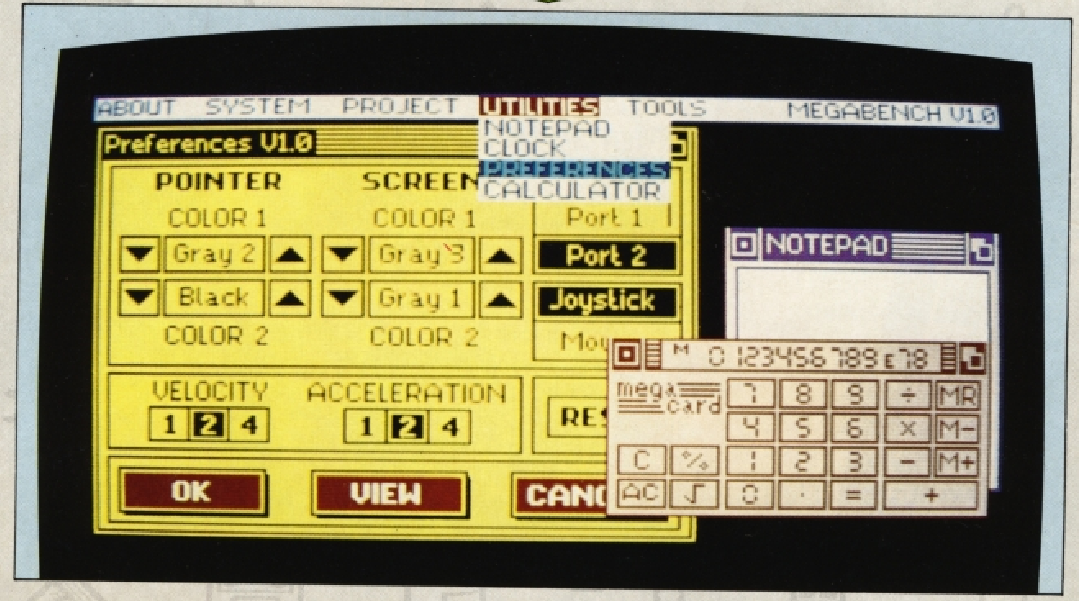
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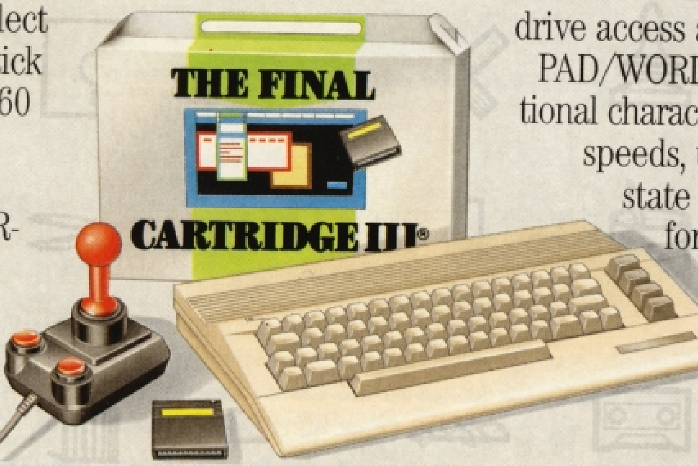
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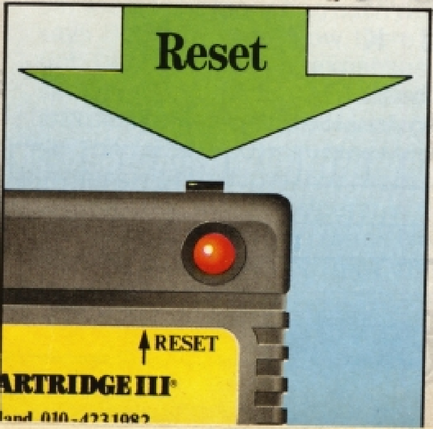
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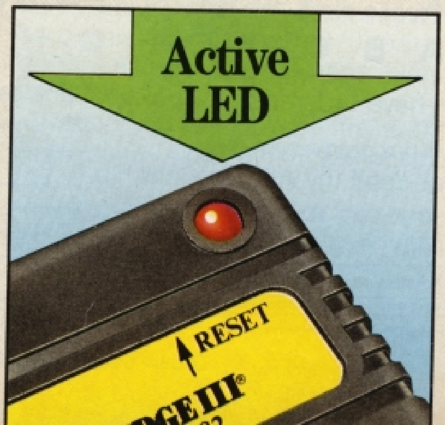
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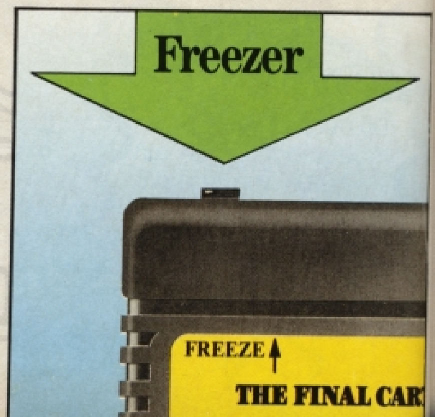
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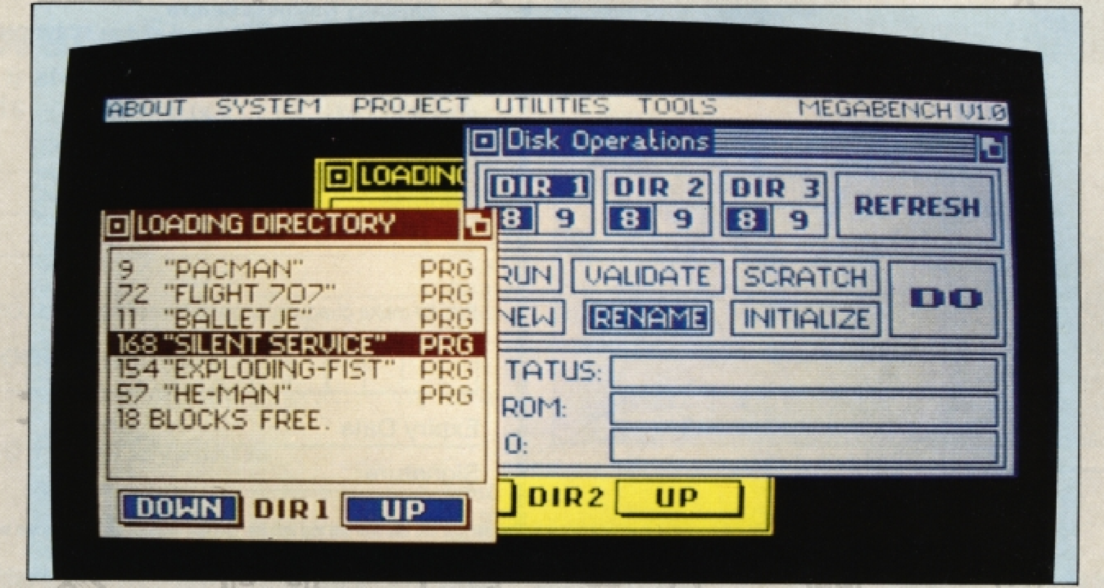
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INITIALIZE
TATUS:
ROM:
O:
DIR2
UP
LOADING DIRECTORY
DOWN
DIR1
UP

```
9  "PACMAN"          PRG
72 "FLIGHT 707"      PRG
11 "BALLETJE"        PRG
168"SILENT SERVICE"  PRG
154"EXPLODING-FIST"  PRG
57 "HE-MAN"          PRG
18 BLOCKS FREE.
```

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A Layman's Burst Mode Guide

by M. Garamszeghy

The 1571 disk drive is proving its popularity all over the world. Yet most people fail to use all its remarkable capability. Often the Burst Mode seems mysterious and somewhat daunting. Mike Garamszeghy is a Canadian expert on many aspects of things Commodore. He has written a four part series that will explain how to master this interesting and useful mode.

Part 3: Burst Write Protocol

In the first two instalments of this series on 1571 burst mode (CCI November and December), we covered the general syntax and application of each of the commands, and the procedure for reading data from the disk. In this instalment, we shall present the procedure writing data in burst mode.

The 1571 disk drive Burst Command Instruction Set (BCIS) contains a single command for writing data to a disk. The burst write command is somewhat analogous to the standard Commodore DOS "Block-Write" ("b-w:" or "u2:") command. Unfortunately, there is no "FAST SAVE" command (corresponding to the burst mode "FAST LOAD" command) which would allow you to write an entire file in burst mode. Similar to most other burst mode commands, the write command will work with either MFM or GCR disks. The burst write is also faster than normal KERNAL controlled writing to the 1571, although the difference in speed is not as great as the difference in reading speeds. The average speed for a burst write using 256 byte sectors is about 600 bytes per second. The corresponding figure in normal 1571 mode is about 400 bytes per second and in 1541 mode it is about 300 bytes per second. In 1571 and burst modes, the write speeds are a factor of 3 to 5 slower than the corresponding read speeds. Unlike DOS's Block-Write, burst write can also be used to write multiple sectors in succession (up to one track worth).

There are six basic steps to follow for a burst mode write operation. These are:

1. log in the disk and send the burst write command string;
2. set the serial port to fast output mode;
3. send the data;
4. set the serial port to fast input mode;
5. read the burst status byte (repeat steps 2 to 5 for a multi sector write);
6. restore default I/O.

The easiest way to log in the disk is to use the burst mode INQUIRE DISK command by sending the command string:

"u0"+chr$(4)

This command will normally return a burst status byte which indicates the condition on the drive controller. If you are interested in its value, the status byte can read using the technique outlined in instalment 2 of this series on burst mode (CCI December). If you are not interested in the status byte (i.e. you are sure of the type of disk in the drive) you can ignore the status byte by sending the burst WRITE command string immediately following the INQUIRE DISK command. As outlined in instalment 1 of this series, the command string for a burst write is:

!"u0"+chr$(xx)+chr$(track#)+chr$(sector#)+chr$(# of sectors)+chr$(next track)

where xx can have the following values:

2 for a write to a GCR disk (either side) or MFM disk (side 0), stop writing if error detected;

18 same as above but for MFM disk side 1;

66 same as value 2 but ignore errors;

82 same as value 18 but ignore errors.

As with the burst block read command, the maximum number of sectors which can be written is equivalent to one track. The actual number depends on the disk format (for MFM disks) or the track number (for GCR disks). If you try to write more than one track worth of sectors, you will overwrite sectors on the same track until the number of sectors specified by the "# of sectors" parameter have been written. This could hopelessly corrupt your disk, so be careful when specifying the number of sectors to write. The "next track" parameter is useful if you are writing several tracks in succession. Normally before a write or read operation, the disk head will return to its "park" position before going to the specified track and sector. If you specify the next track option, the head will go to this next track directly without going to park first. This saves both time and wear and tear on your drive by preventing the head from bouncing around like a yoyo. Both the INQUIRE DISK and WRITE command string can be sent via either a BASIC PRINT# statement or a machine language CHROUT routine.

The second step is to change the fast serial port direction from the default "input" mode (data flow from the 1571 to the C-128) to "output" mode (data flow from the C-128 to the 1571) and set up the initial clock state. This is done with a short machine language routine using the new C-128 KERNAL SPIN/SPOUT routine (Serial Port INput/Serial Port OUTput). To set the mode to output (SPOUT), the routine is called with the carry flag set:

```
sei              ;  disable interrupts
sec
jsr     $ff47;   SPIN/SPOUT
lda     #$40
sta     clock
```

The last two instructions start the test for the system clock state on a high value. The label "clock" refers to any usable RAM location (such as zero page $fa to $ff) which is used in subsequent steps as a temporary storage location for testing the state of the system clock.

Once the system has been initialized, the data can be sent. Similar to the read protocol discussed in the previous instalment, data are sent to the 1571 based on a simple toggle handshake using the Acknowledge and Ready for Data (AFRD) line. The procedure is as follows:

```
       ldy   #$00;    reset buffer data
                          index
wait1:lda    $dd00;   read AFRD clock state
       cmp   $dd00;   debounce
       bne   wait1

       eor   clock
       and   #$40;    check state of AFRD
                          clock
       beq   wait1

       lda   ($fa),y; get data byte from RAM
                          buffer
       sta   $dc0c;   send data

       lda   clock

       eor   #$40;    toggle state of "clock"
                          register
       sta   clock

wait2:lda    #$08
       bit   $dc0d;   wait until byte sent
       beq   wait2

       iny
       bne   wait1
```

The above routine assumes a 256 byte sector of data is to be transferred (remember MFM sectors can be 128, 256, 512 or 1024 bytes while GCR sectors written with this command are always 256 bytes). Indexing routines for other sector sizes are given in Table 1. The first instruction resets the data buffer index. It is assumed that the data buffer address is stored in zero page locations $fa and $fb in standard low byte, high byte format. The next six instructions form a wait loop until the serial port clock pulse is in the correct phase. The next two instructions retrieve the data byte from memory and send it to the serial port. Because the size of the data buffer in BANK 15 (the default BANK for I/O operations) is limited for reasons outlined in instalment two of this series, the "lda ($fa),y" instruction can be replaced with:

```
    ldx  #$3f
    stx  $ff00
    lda  ($fa),y
    ldx  #$00
    stx  $ff00
```

This allows you to use most of BANK 0 free RAM as a data buffer. The next group of three instructions toggles the state of the clock comparison register. The three instructions beginning with the "wait2" label form a loop until the interrupt control register (ICR) of CIA#1 signals that the transmission of the data byte is complete. The final two instructions increment the buffer pointer and repeat the process for the next byte until a complete sector has been sent.

The 1571 returns a status byte after each sector has been written. To read this byte, the fast serial port must first be set to the read (SPIN) direction followed by a ready signal to the 1571. This is done with:

```
    clc;          clear carry flag
    jsr  $ff47;   SPIN/SPOUT
    bit  $dc0d;   reset CIA ICR
    lda  $dd00
    ora  #$10;    set AFRD clock low
    sta  $dd00
```

The status byte can then be read with a standard burst mode read:

```
    lda  #$08
wait3:bit  $dcod; wait for byte
    beq wait3
    lda  $dc0c; read status
    sta  $fa;    store it somewhere if
                 you want
    lda  $dd00
    and  #$ef;   set AFRD clock hi
    sta  $dd00
```

If more sectors are to be written, the whole process starts over again from step 2 (set serial port to SPOUT) until the specified number of sectors has been written.

Once all sectors have been written, the final step is to restore default input/output (I/O) channels:

```
    cli
    jsr  $ffcc;  clrchn
```

That, my friends, is all there is to writing in burst mode. And now for the demonstration. Listing 1, 1571 BURST COPY, is a short BASIC program with machine language loader which uses burst read and write routines for copying disks on the 1571 drive. The program will make an exact duplicate of your GCR disks (either normal Commodore DOS or CP/M) with only two swaps for a single sided disk or four swaps for a double sided disk. The program is relatively fast (about 6 minutes for a single sided disk or 12 minutes for a double side disk) and very easy to use. Just follow the prompts on the screen. Because the copy is exact, there is no way to distinguish between the original (source) and copy (target) during the copy process (the i.d. code also duplicated). I recommend, therefore, that you cover the write protect notch on the source disk to prevent disaster from striking if you accidentally mix up the original and copy disks during the copy process. While 6 minutes may not seem particularly fast (some 1541 disk copy programs can do it in 4 minutes), the program is very simple (therefore reliable) and does not resort to sophisticated reprogramming of the disk drive. (In addition, with most 1541 fast copy programs, the screen is blanked out and all extra devices must be removed from the serial port. Neither is necessary for this program.) With a full disk, 1571 BURST COPY is more than twice as fast as the 1571 DOS shell "copy a disk" utility. (The DOS shell routine only copies allocated blocks on the disk while BURST COPY will copy everything. Even so, BURST COPY will be faster for all but an almost empty disk!) It is also far more versatile. Because it copies everything on the disk, BURST COPY can also be used to copy C-128 CP/M disks (GCR format only — but it can be easily modified to copy MFM disks also) and disks with unallocated random files (I admit to being sloppy because I don't always allocate the blocks for my random files) neither of which can be copied with the DOS shell program. Although the target disk is formatted on both sides, only one side is used if the source disk was single sided thus maintaining full compatibility with the 1541 drive. (The DOS shell writes everything to a 1571 double sided disk which may not always work in 1541 mode because a file might be stored partly or completely on the inaccessible flip side.) The six minutes for a single sided disk breaks down approximately as follows:

20 seconds to read first 357 blocks from source disk
40 seconds to format target disk (always double side format)
2½ minutes to write first 357 blocks on target disk
20 seconds to read final 326 blocks from source disk
2⅓ minutes to write final 326 blocks on target disk

A double sided disk repeats the process for side two, but the disk is not formatted again.

In the final instalment on 1571 burst mode, we will examine in greater detail some of the options of the various commands.

TABLE 1: SUMMARY OF ASSEMBLY LANGUAGE BURST MODE WRITE ROUTINES

General write-a-burstbyte routine (used by all subroutines below)

```
   write: lda $dd00
          cmp $dd00 ;debounce AFRD clock
          bne write
          eor $0d00
          and #$40
          beq write
          ldx #$3f   ;switch to bank 0
          stx $ff00
          lda ($fa),y ;get data
          ldx #$00   ;back to bank 15
          stx $ff00
          sta $dc0c ;send data
          lda $0d00
          eor #$40
          sta $0d00
          lda #$08
   wait:  bit $dc0d ;wait till sent
          beq wait
          rts
```

Read status byte routine

```
 readst: clc
         jsr $ff47  ;set SPOUT
         bit $dc0d  ;reset ICR
         lda $dd00
         ora #$10   ;set AFRD input
```

```
        sta $dd00
        lda #$08
 waitr: bit $dc0d
        beq waitr    ;wait for byte
        lda $dc0c    ;get status
        sta stat     ;stash it
        lda $dd00
        and #$ef     ;reset AFRD
        sta $dd00
        rts
```

NOTE: Before using any of the following routines, you must load zero page locations $fa and $fb with the low and high bytes of the start of your data buffer and call the appropriate burst mode command. Location $0d00 in the RS-232 buffer is used as a temporary storage register for testing the clock phase.

Write N 128 byte sectors:

```
        ldx #number of sectors to write
        stx $fc
        ldx #$00
        stx $f ;# sectors written
        lda #$40
        sta $0d00; temp storage
        sei
 nexts: ldy #$00
        sec
        jsr $ff47; set SPOUT
 nextb: jsr write
        iny
        cpy #$80; end of sector
        bne nextb
        jsr readst; read status
        ldx $fd
        inx
        cpx $fc    ; last sector?
        beq end
        stx $fd
        tya
        clc
        adc #$80   ; incr pntr 128 bytes
        sta $fa
        bcc nexts ; read next sector
        inc $fb
        jmp nexts
   end: cli
        jsr $ffcc ; clrchn
        rts
```

Write N 256 byte sectors:

```
        ldx #number of sectors
        stx $fc
        ldx #$00
        stx $fd ;# sectors written
        lda #$40
        sta $0d00; temp storage
        sei
  nxts: ldy #$00
        sec
       jsr $ff47; set SPOUT
 nextb: jsr write
        iny
        cpy #$00; end of sector
        bne nextb
        jsr readst; read status
        ldx $fd
        inx
        cpx $fc    ; last sector?
        beq end
        stx $fd
        inc $fb
        jmp nexts ;read next sector
   end: cli
        jsr $ffcc
        rts
```

Write N 512 or 1024 byte sectors:

```
        ldx #number of sectors
        stx $fc
        ldx #$00
        stx $fd ;# sectors written
        lda #$40
        sta $0d00; temp storage
        ldx #sector size/256
        stx $fe
        stx $ff
        sei
 nexts: ldy #$00
        sec
        jsr $ff47; set SPOUT
 nextb: jsr write
        iny
        cpy #$00; end of page?
        bne nextb
        ldx $fe
        dex
        stx $fe
        inc $fb
        cpx #$00 ;end of sector?
        bne nextb
        jsr readst; read status
        ldx $ff
        stx $fe
        ldx $fd
        inx
        stx $fd
        cpx $fc    ; last sector?
        bne nexts
   end: cli
        jsr $ffcc
        rts
```

THE KING OF CHICAGO

Mirrosoft

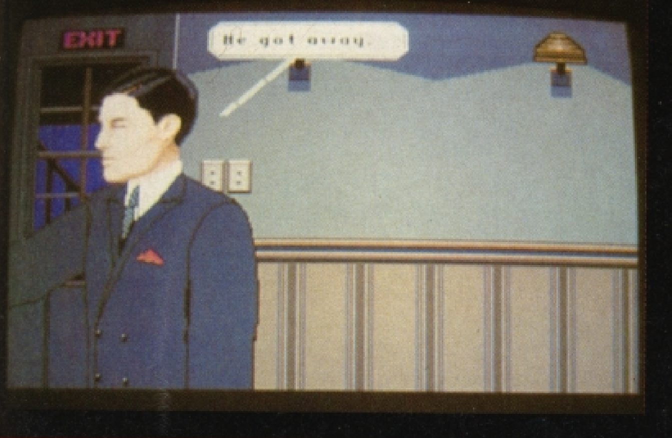
(Dual drive systems only)

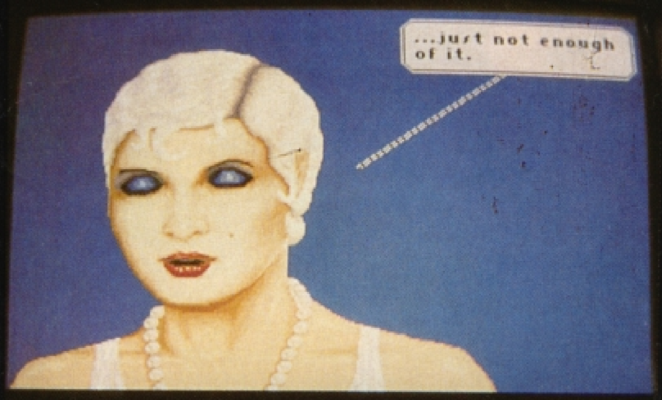
Going on past Cinemaware releases, we've come to expect great things from each new developement in the series. The latest, King of Chicago, comes forward in time from the days of Sinbad, and is set in Chicago in the 1930's. Can Mirrorsoft make it three mega-biggies in a row with the Cinemaware series?

Chicago in the thirties was no place for a half-baked gangster. You are no mummy's boy. You can and need to dish out some pretty rough treatment if you're to end up with the title 'King of Chicago'. Following in the style of Defender and Sinbad, the game is played mainly by making strategic decisions with the odd bit of dextrous mouse-play.

A respected member of the Northside gang, you decide that the old man's past it. He can no-longer run the mob how it should be done, and there's only one man who fits the bill, you. Before taking over as boss, the old man has to go, so it's time he went for a swim in concrete wellies. Yes, it's a dirty trick, but then this isn't a cricket simulation,is it? This is Chicago (Is that really a violin case that music student is carrying?).

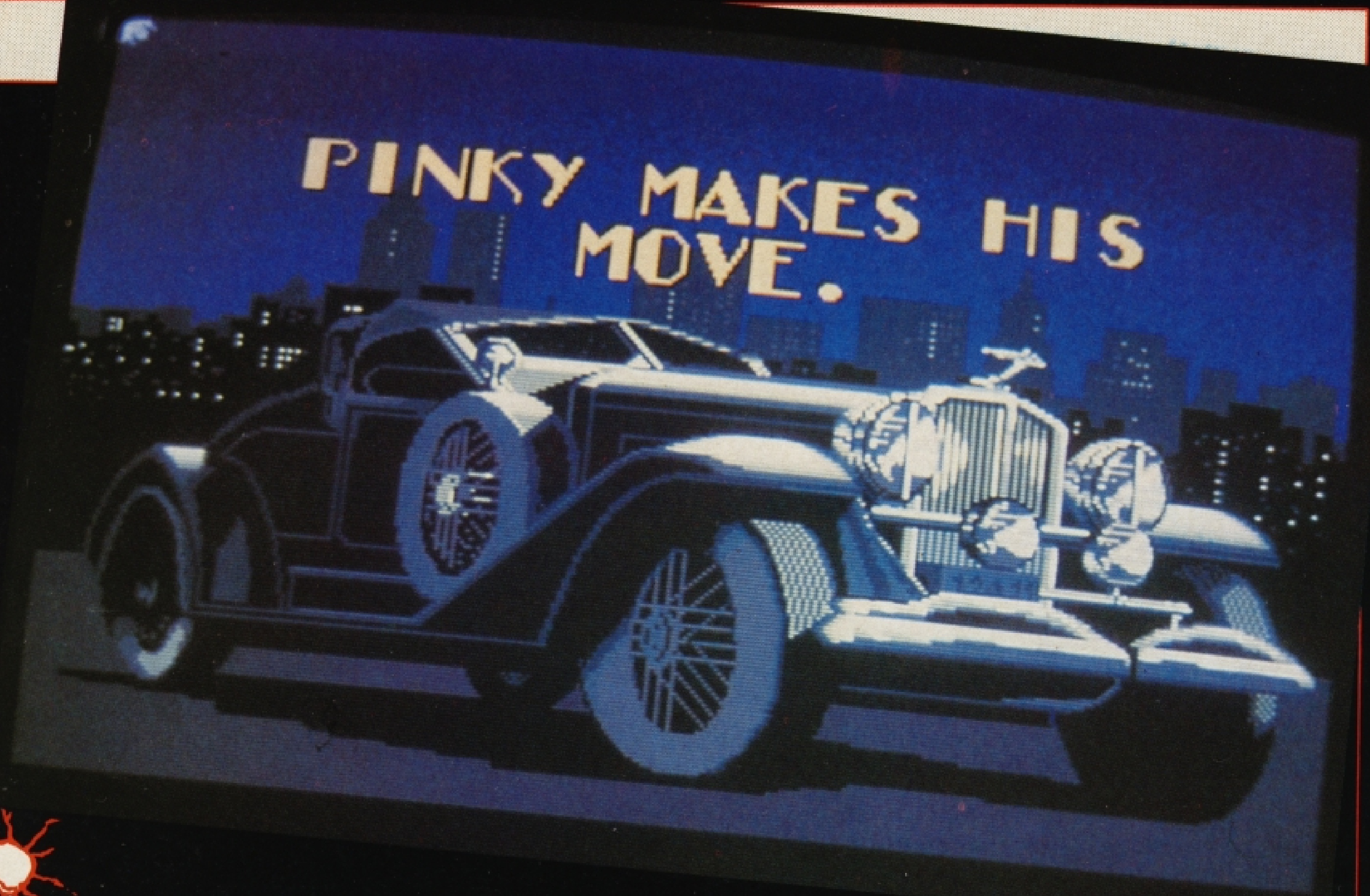
Much of the game is played by selecting thoughts that bubble out during dialogues.





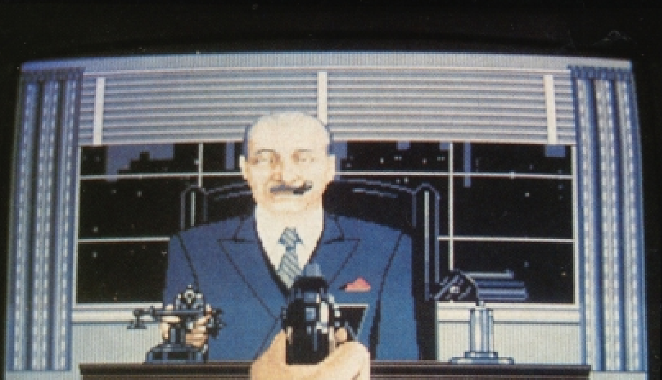
You don't actually choose what to say, but your thoughts are translated into the appropriate comments, and then to actions. Throughout the game you will have to keep your image as a toughie, but try not to upset Lola, your dame. Lola is a very touchy, spoilt, whiney girl, but is very good looking. Buy her a scarf and she wants a coat, buy her a ring and she wants a necklace. Personally, I don't know why he bothers with her. I would just smack her one in the face with a grapefruit and toss her out!

Being a hard-nut gangster, Lola is the least of your troubles. Gang members, including yourself, can be very underhand, and won't think twice about rubbing out an unpopular boss. A balance must be struck between a wall hard leader, but one who keeps his cool and knows when to keep his gun to himself.



High Graphic Quality

The graphics of Defender of the Crown must have amazed everyone, but although the general quality in King of Chicago is very good, it is let down sometimes by the contrasting detailed faces and the simple bodies they are stuck on, giving a cardboard cut-out look to them. There's room for improvement in the speech bubbles, but these are very minor gripes. As you can see from the screenshots, the overall effect is one of high graphic quality.



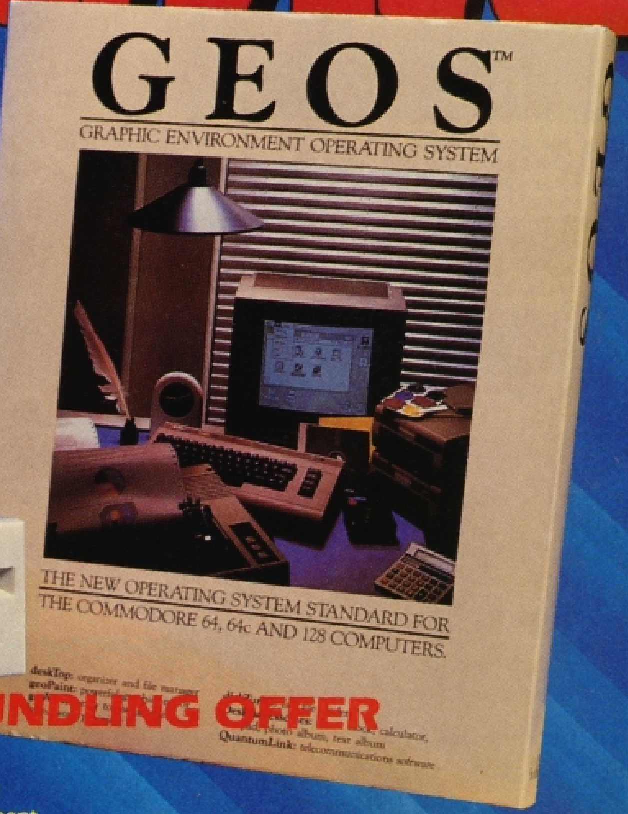
When you pluck up the courage to bump off the old man, it's time for some action of the shooting type. The old boy's not too quick on the draw and can be dealt with easily. (Shoot the tyre of the car first.) Bomb-runs on the local barber's shop can prove more tricky, and shooting people in moving cars are a problem before you discover alternative tactics.

The game is packed full of appropriate snippets of music which go with the many different scenes. So many in fact, that they take up two disks which are continually accessed. Bad news for those with single drive systems I'm afraid. King of Chicago is at present only available for dual drive systems, partly because it's thought that constant disk swapping would spoil the game, and partly because there was no memory left for such things as the "please swap disk" messages, which sounds like a bit of a weak excuse to me. Whether or not a single drive version is planned, I don't know, but it would seem silly not to release one.

So how does it compare to previous Cinemaware games? I have to say it seems to me not quite to reach the exceptional standards of what's gone before, but others may well feel differently. Coming from anyone else, King of Chicago may well have been thought terrific, but it does have a very high reputation to live up to. This is by no means a bad game, and will give a huge amount of enjoyment to fans of the Cinemaware gameplay style.

T.H.

DYNAMIC DUO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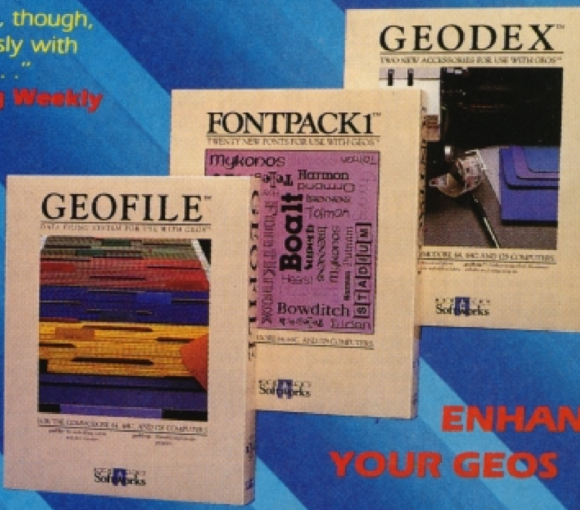

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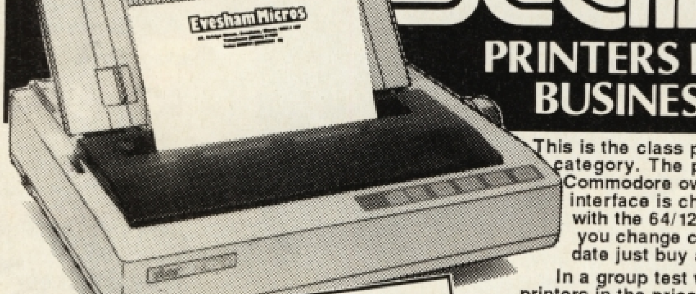

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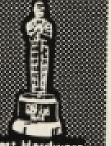

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Getting started

With the arrival of Andy Moss as resident adventure wizard in these hallowed pages, a lot of CCI readers must have been introduced to adventure games over the last few months. There are those of us who have been addicted from the start, of course, including yours truly, who can remember spending all of one Sunday morning (after a party) from two o' clock to midday struggling through a version of *Colossal Cave* on a Commodore PET with disk drive, armed only with a steadily diminishing bottle of scotch!

A love of playing the games led to an almost greater love of writing them, and over the years I've continually been improving on my own method of producing increasingly better adventure games. This has meant that such admittedly useful aids for the would be games as The Quill and the like have passed me by. I don't decry them, I just don't use them. I've grown used to doing things my way, and over the next few issues I'll be interupting myself from interrupts and concentrating on showing you some of the routines I use to produce my adventures. They'll all be taken from a finished game, and hopefully you'll soon be in the position of being able to produce your own adventures for the Commodore range of computers, since I'll be using a 'standard' Commodore Basic suitable for all the machines. I don't expect, however, that many Amiga fans will be interested! I'm concerned more with 64s, Plus-4s, C16s, and perhaps even the dear old VIC.

First steps

We can go a reasonably long way without knowing anything about what our finished adventure will either look like or be concerned with, but it's always a good idea to give yourself some sort of guideline. That is, we'll be writing a western adventure, or a space adventure, or whatever. The adventure that I'm taking the listings from is one about the exploits of the legendary dward Dimli Gloing and his hapless wizard companion Strombrigner (dyslexic parents) the Grey. All you're told at the start of the game is that you have to find the pond and rid it of the awful curse that has befallen it, and that a liking for puns will be of considerable help, so that's all that you're going to get as well.

I must stress that these are not 'complete' listings, in that some bits have been taken out that are very specific to the adventure concerned, and they would only confuse someone trying to produce their own game. Having said that, they do still work.

From now on then we can forget about ideas for adventures, at least for this month. You can perhaps do some thinking before the next issue comes out, but more on that topic later. Let us instead consider what goes into making up a complete adventure. A typical sequence of events might look like this:

Receive input from player
Analyse input
Is player trying to move? Subroutine (a)
Is player trying to do something? Subroutine (b)
Go and get another input

Subroutine (a)
Can the player move? If yes then move him to new location, draw up graphics if required, print text description, objects found, exits available, any event that might happen as a result of visiting that location, and go and get another input. If the player can't move, tell him so and go for another input again.

Subroutine (b)
Can the action be performed? If yes, then do so and inform player of the consequences of his deeds before receiving anothe input. If not, tell the player so and again go for another input.

And that's all there is to writing adventures. Easy, really, isn't it? Well, no, of course it isn't, otherwise we'd all be doing it. On the other hand it's not that difficult to produce a working, playable game that will at least impress your friends. That's how I started out, and I ended up with the good fortune to have a number of games marketed. Go for it!

For the rest of this article we're going to be concentrating on receiving and analysing an input from the player, and in order to do this we'll need to have a list of words that the adventure will understand. Parsers (that bit of the program that works out what the player's trying to do) have come a long way from the VERB . . . NOUN input that characterised so many games in the early days of adventuring. Although I'm not going to get as complex as *The Pawn*, for example, we'll easily be able to cope with things like ***wedge the grate with the***

stick, give the flowers to the hippy, say to strombrigner "open the door", and I can't think of any adventure that really needs to use anything more complex than that. If it does then it will probably be impossibly complicated and ridiculously hard to understand, but if you want to have things like ***walk south quietly*** then that's up to you.

Talking to characters is a special case, and we'll cover that in another article. For now, we'll stick to ordinary sentences, and the first thing our parser needs to do is to break them down into distinct word groups. I've termed these groups verbs, links, actions and nouns, with the 'link' group being the crucial one. If we look at four example sentences, you'll see how the system works:

wedge the grate with the stick: verb-wedge, link-grate, action-with, noun--stick.
open the red door: verb-open, link-red, noun-door. Here, action has no value.
open the door: verb-open, noun-door. This time, both action and link have no values.
south: verb-south, everything else has no value associated with it.

First of all a verb is found, and every occurence of "the" is discarded. If only one other word is found then it's assumed to be a noun, whereas if two other words are found then one's a noun and the other one's a link, but if three other words occur then all three of link, action and noun will have something stored in them. Anything more than that is ignored, but by choosing our words carefully in the first place we can appear to be doing more than we actually are: ***wedge the grate with the stout stick*** becomes a possibility.

The final thing that our parser needs to do is to cope with sentences like *take the brush and the key and go south, s:* something it will handle with ease, as we shall see.

Obviously, from all this, we need to set up tables of words that the computer can understand, and this is where you really do need to know a little bit about your adventure. Fortunately the system is very flexible and can easily be added to and amended as you get deeper and deeper into the game, but to give you some idea of what's going on we'll pick a few sample words that might be found in any adventure.

Verbs: go, n, s, e, w, north, south, east, west, take, get, drop
Nouns:n, s, e, w, north, south, east, west, key stick, quietly, carefully
Actions: on, in, under, over, with, to, from, at, into, onto, behind, through

You'll notice that we have no link words specified here. This is because the link words are made up of all the action words plus all the noun words. Secondly, although I've used the words in full in this example, in the real game you'll only need the first five letters of each word, as this is all that the parser examines. You could easily change that to six (like ***Infocom***) if you wanted to. From the examples given earlier, you'll see that we can already cope with inputs like ***go north quietly, drop the key under the stick,*** and so on. Coping with and acting on are two different things, though, and in order to act on these inputs we have to turn the words into numbers. To take the example ***go north quietly,*** let's see how that could be converted into numbers.

The word 'go' is the first word in our verb table, so if we had a variable VB dedicated to verbs, then VB would equal one here. As link words consist of all the action words plus all the noun words, then the word 'north' would be the 17th word in the link table (bypassing the 12 action words and the first four noun words on the way). Thus if we had a variable LI dedicated to links, then LI would equal 17. Finally, the word 'quietly' is the 11th word in our noun table, and so if we had a variable NA associated with nouns then here NA would equal 11. Now you can almost see the line of Basic:

IF VB=1 AND LI=11 AND NA=11 Then go and do something about it!

We can make life far easier for us than that when moving around, but that too must wait for another article. For now, let's examine the listing and see how all these values are produced.

We'll get the easy part out of the way first, namely lines 4295 to 4380, which are there purely to ge the sentence from the player, and replace the easy to corrupt INPUT command of Basic. Line 4335 is the crucial one, where we check the ASCII value of any key pressed by the player and accept or reject accordingly. In order of appearance we have the letters of the alphabet, the space bar, a comma, the RETURN key, the delete key, and finally a set of quotes. Anything other than those keys is ignored, so you'll have to amend that as you see fit for your own adventures. Line 4340 checks that the length of the input hasn't exceeded 75 characters (an arbitary character) before the next line makes sure that the player can't type various characters as the very first character of the input. Then, line 4355 deals with the return key, storing the input string CM$ in PK$, for reasons that we'll come to later, while line 4365 deals with the delete key. The last line, line 4380, then just adds whatever key has been pressed to the current contents of the input string echoing the result of the screen.

At the end of all this we have our input string, stored as CM$, and we come to the tricky part of the program.

Checking the input

Lines 4000 to 4290 do the job for us, and in your programs you'd have something like ***10 GOSUB 4000*** in order to use the routine. Line 4005 is quite crucial, since it sets the verb to be equal to the previous verb used (PV$=NA$, allowing things like ***TAKE HAT AND COAT,*** which the program interprets as ***TAKE HAT AND TAKE COAT),*** the noun to equal the previous noun used (PN$=NA$, allowing things like ***TAKE HAT AND EXAMINE IT,*** which the program interprets as ***TAKE HAT AND EXAMINE HAT),*** as well as setting the input string CM$ into PR$. This is for use in multiple command sentences (like ***S,S,S,E,E,N***), which are recognised by the variable AN, and if this is set then the last part of line 4005 realises that we don't need to get another input yet and jumps straight to line 4011, bypassing the input line 4011 on the way.

Having got our input, lines 4011 and 4013 check for various words being used which are not essential to the solving of the game but which the player might type in. This gives the feeling of a program with a very large vocabulary, when in fact we're not using that many words (typically about 200 words are essential, although the program can cope with far more thn that). The parts about ***MESS = 80, or whatever, followed by GOSUB 5990***, refer to a subroutine which drags the 80th messge (obviously depending on the value stored in MESS) from a collection of files on disk. We'll come to that another time.

Lines 4015 and 4020 then check for the two words that allow commands to be repeated (***AGAIN*** and ***A***), as some programs require that you ***EXAMINE CHEST*** two or three times before getting the desired result. Then, line 4025 sets all the variables that we're using to zero or null strings, before lines 4026 and 4027 increase the vocabulary again by looking for a variety of words that are unessential to the game. The occurrence of lines of this type could be greatly increased, as indeed it is in the finished game, the ones left in just being there by way of example.

Then we leap to line 4210, where in the lines from 4210 to 4235 we're checking for multiple inputs and setting our player's input string CM$ accordingly. Both commas and the word ***AND*** can be used as a separator, so that something like ***TAKE HAT AND COAT AND GO SOUTH,E,E*** can be coped with.

Back to line 4040 again, with lines 4040 to 4045 finding our verb for us. Line

4050 is a special case, the verb ***SAY***, which as I said we'll be looking at in another article. Lines 4052 to 4065 then weed out the words "A" and "THE" as being not necessary to the input. Then lines 4070 to 4100 sort out our links, actions and nouns, depending on how many words have been typed in by the player and whereabouts they occur in this sentence. Having got the words, the next part of the routine is there to give us our numeric values, enabling the Basic parts of the rest of the program to be built up accordingly.

This starts in line 4105, where we take the first five letters of each word. Good old Commodore Basic is quite tolerant here, allowing us to take the first five letters of a word that has got less than five letters! Sensible stuff.

Line 4107 copes with the verb GO by simply switching the noun into the verb and then discarding the noun; this is only for the adventure in question, you might not need to do this in yours if you sort out your word tables clearly in the first place, but we leave it in as an example of the competent programmer (me) getting it wrong . . .

Lines 4109 to 4115 then check the verb against the list of words stored in the verb table, but if no match is found the first time around then put the verb in the noun and use the previous verb to see if that was recognised, thus effectively changing ***TAKE HAT AND COAT*** to ***TAKE HAT AND TAKE COAT.***

Lines 4120 to 4145 then do the same for the link words and the action words, jumping out of the check if there's nothing stored in them, or putting the unknown word into DN$ if it's not recognised.

Nouns next. Line 4151 returns from the routine if we have no noun, line 4152 uses the previous noun if the word ***"IT"*** is encountered, before lines 4160 to 4165 search through our noun tables to see if the word is a recognised one.

Lines 4170 to 4206 are then used to print up suitable messages about non-recognised words, using the string DW$ (containing ***I don't understand the word***) if required. All the same we've used variables NV, NL, NC and NN for the number of verbs, links, actions and nouns respectively, and this is also used when checking through for a known word being used out of context (as in ***DOOR OPEN*** for example). At least, that's the theory, although memory restrictions forced me to abandon this in line 4195 and just use the value 63 instead. Ideally you'd dimensio the verb, link, action and noun word tables to contain the highest oat of NV, NL, NC and NN, so that we could check for every word in the table, not just the first 63, but as I say I ran out of memory. Hopefully you'll not have to suffer from the restrictions.

Conclusion

The parser is probably the most important part of the program, and although this is by no means the most efficient way of doing things it has the wonderful advantage that it works, and has been tried and tested on many occasions.

Next month we'll be looking at mapping out the game and getting the player moving around, so thinking caps on and sort out the scenario for your adventure before the next issue of CCI arrives. What is it about, what problems are you setting the player, draw up a rudimentary map, and I'll see you next month. Until then, it's goodbye from him, and it's goodbye from me. Goodbye!

continued on page 125

```
Listing One - The Parser

4000 REM parser starts here
4001 f1=0
4005 pv$=vb$:pr$=cm$:pn$=na$:pp$=n1$:se=0:ag=0:IF an<>0 THEN PRINT:cm$=an$:GOTO
4011
4006 pv$=""
4010 PRINT:PRINT ">";:GOSUB 4295:lc=LEN(cm$)
4011 a$=LEFT$(cm$,5):IF a$="break" OR a$="smash" OR a$="attac" THEN mess=80:GOSU
B 5990:GOTO 4290
4013 IF cm$="d" OR cm$="down" OR cm$="u" OR cm$="up" THEN mess=82:GOSUB 5990:GOT
O 4290
4014 REM
4015 IF LEFT$(cm$,5)="again" THEN ag=1:cm$=pr$:an$=MID$(an$,7):pk$=MID$(pk$,7):I
F an$="" THEN an=0
4020 IF LEFT$(cm$,1)="a" AND lc=1 THEN ag=1:cm$=pr$:an$=MID$(an$,3):pk$=MID$(pk$
,3):IF an$="" THEN an=0
4025 na$="":li$="":ac$="":vb$="":na=0:vb=0:ac=0:li=0:v1$="":l1$="":a1$="":na1$="
"
4026 IF LEFT$(cm$,3)="why" THEN mess=165:GOSUB 5990:GOTO 4290
4027 IF a$="where" OR LEFT$(cm$,4)="find" THEN mess=166:GOSUB 5990:GOTO 4290
4030 lc=LEN(cm$)
4035 GOTO 4210
4040 REM start checking
4042 FOR i=1 TO lc:IF MID$(cm$,i,1)=" "THEN v1$=LEFT$(cm$,i-1):k=i:GOTO 4050
4045 NEXT i:v1$=cm$:GOTO 4105
4050 IF v1$="say" THEN vb=17:RETURN
4052 FOR i=k TO lc:IF MID$(cm$,i,3)=" a " THEN cm$=LEFT$(cm$,i-1)+MID$(cm$,i+2)
4055 NEXT:FOR i=k TO lc:z$=MID$(cm$,i,5)
4060 IF z$=" the "THEN cm$=LEFT$(cm$,i-1)+MID$(cm$,i+4)
4065 NEXT
4070 FOR i=k+1 TO lc:IF MID$(cm$,i,1)=" "THEN l1$=MID$(cm$,k+1,i-k-1):k=i:GOTO 4
```

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Screenshots from Commodore version.

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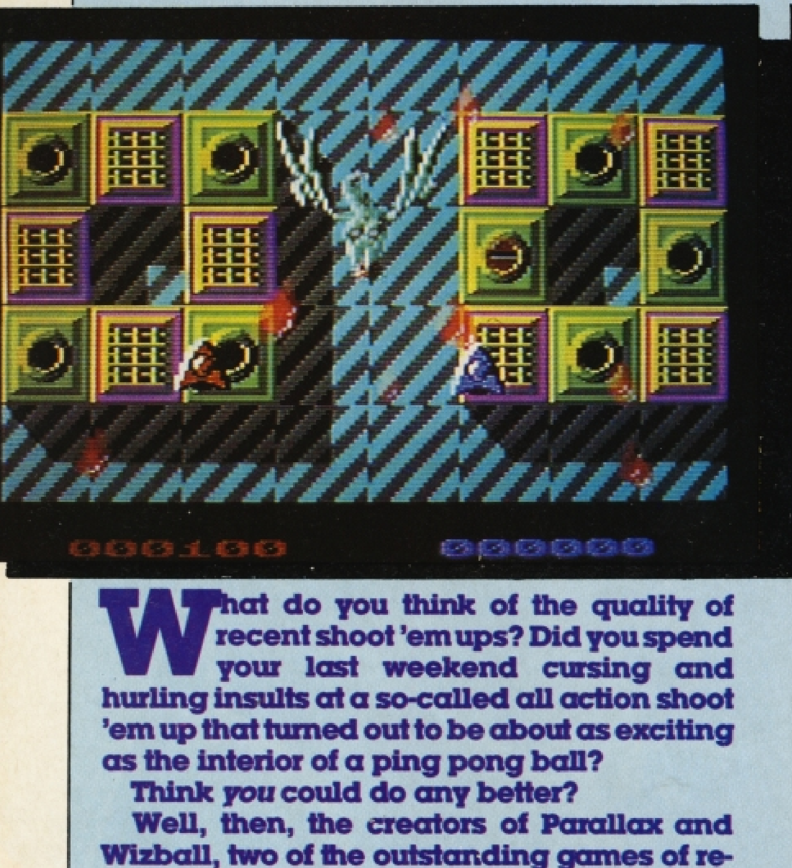
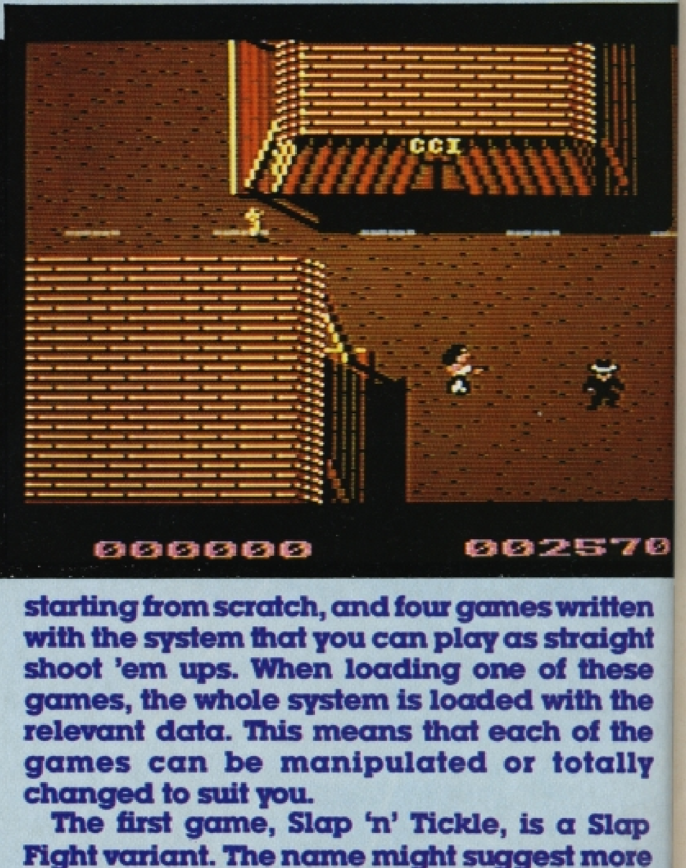
Outlaw





What do you think of the quality of recent shoot 'em ups? Did you spend your last weekend cursing and hurling insults at a so-called all action shoot 'em up that turned out to be about as exciting as the interior of a ping pong ball?

Think *you* could do any better?

Well, then, the creators of Parallax and Wizball, two of the outstanding games of recent years, Sensible Software have just the ticket. The Shoot 'em Up Construction Kit is a very neat menu-driven game designer. Constraints imposed by the system are that it must be either over a still or vertically scrolling background, and that it must involve one or two main characters progressing to a final goal whilst fighting off nasties. But within that, there is a whole world of excitement to be found.

The package comes with the system which contains only very basic game data, used for starting from scratch, and four games written with the system that you can play as straight shoot 'em ups. When loading one of these games, the whole system is loaded with the relevant data. This means that each of the games can be manipulated or totally changed to suit you.

The first game, Slap 'n' Tickle, is a Slap Fight variant. The name might suggest more of a spoof than a playable game, but it really is of a very high quality showing off the system's capabilities excellently. Outlaw is a Gunsmoke/Commando style game which demonstrates its 'push' scrolling capability ie. scroll with the player. Transputer Man combines still and scrolling screens set inside a computer. The final game was designed by various characters from the industry. Entitled Celebrity Squares, it's surprisingly good to play.

Sub Menu

When you set about creating the next budget (or even full priced) number one, it's suggested that you start by tinkering with the existing games to get a feel of the system. Jumping straight in with a blank system could prove very confusing to a beginner. After playing the selected game, most people would go straight for the sprite editor, conveniently placed at the top of the main menu.

Selecting edit sprites opens up a sub-menu with options for re-drawing, colouring, sliding, mirroring and copying of sprites. All defined sprites can be cycled through to find required image when it can then be re-defined using a large scale grid, with the sprite as it will be in the game, shown in the corner of the screen. The slide facility comes in handy for re-positioning and centering sprites.

Next on the main menu is edit objects. Any sprite used in the game must be defined as an object, and given a name. For example, design a couple of different alien sprites, and they could be defined as alien 1 and alien 2. Each object can have up to 18 frames of animation and have its own features such as fire rate and type, speed, sound effects, explosion, and bullet speed.

Editing the background can be time consuming and confusing to begin with. The background is made up of re-defined characters which must be placed into 5 x 5 blocks before being positioned on the background map.

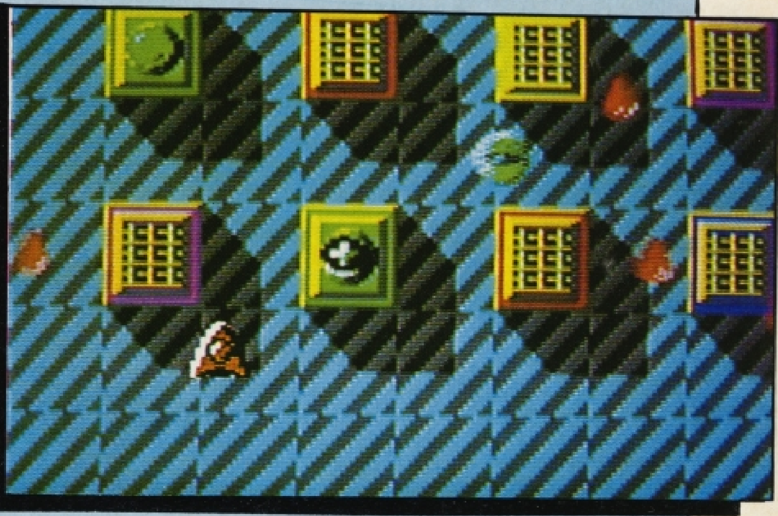
The sound effects editor is the most fun and user friendly aspect of the system. The screen shows 8 elements of the sound, in the form of the sliders you would find on a mixing desk. Messing about with these you can create loads of varied sound effects to suit any occasion.

Aliens are placed onto the background with the attack waves option. Select the alien and move to the appropriate area of the background. Press fire and move the alien in your chosen path. You've now got one more alien. It couldn't be simpler.

20 Levels

Your game can have from 1 to 20 levels. Each level may be still, scroll at one of two speeds, and the scrolling can be either continuous, or move with the player(s). The area in which each player can move is variable. This is useful for Commando games when you don't want the character to advance too far up the screen before it scrolls.

With all this done, all that remains is to edit the 'front end'. This is a title screen made up of text that can glow in a number of colours, or be in one colour. This character set can be altered, so in fact the title screen could have graphics in it.



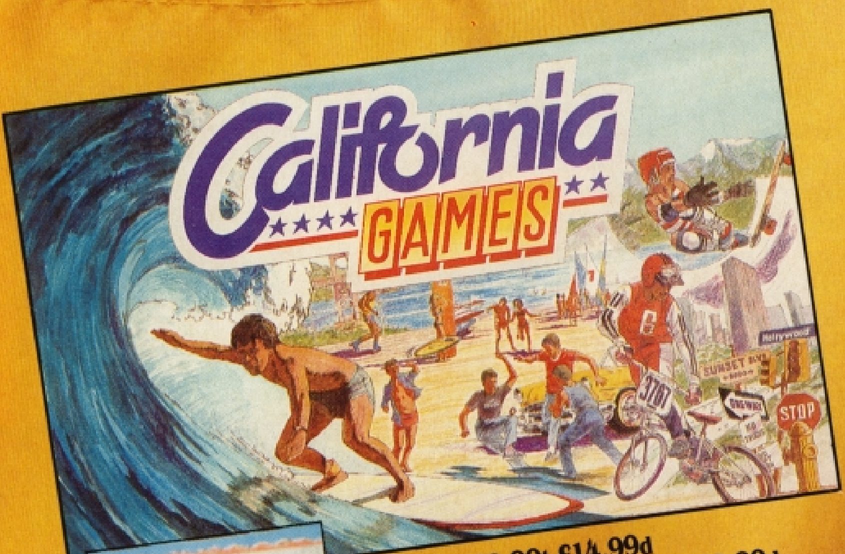
The Shoot 'em Up Construction Kit isn't something you can sit down with for ten minutes and write Uridium II. A lot of time needs to be spent, both in the design and construction of a game, but if you've got the will, some excellent games can be created without any prior knowledge of programming.

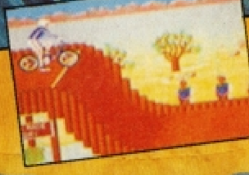
At £14.95 on cassette and £19.95 on disk, it's not cheap, but is an excellent piece of software, easily the best of its kind. With the added incentive of being able to write free-standing games which can be sold just as any other game, Shoot 'em Up Construction kit will turn would-be game programmers into will-be game programmers.

T.H.

Rating: 92%
Price £14.94 (cass) £19.95 (disk)

“The Undisputed Cham





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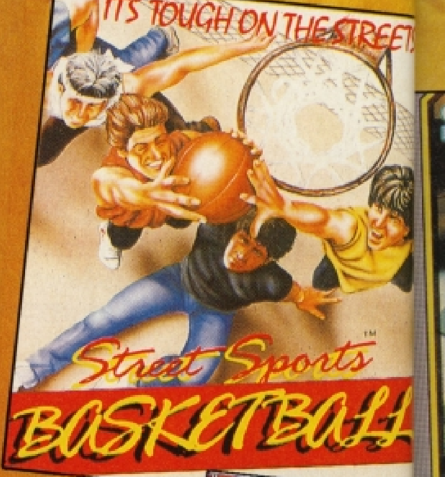

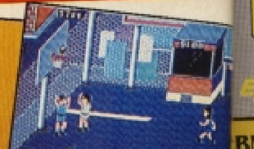

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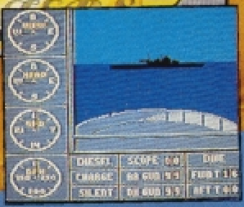
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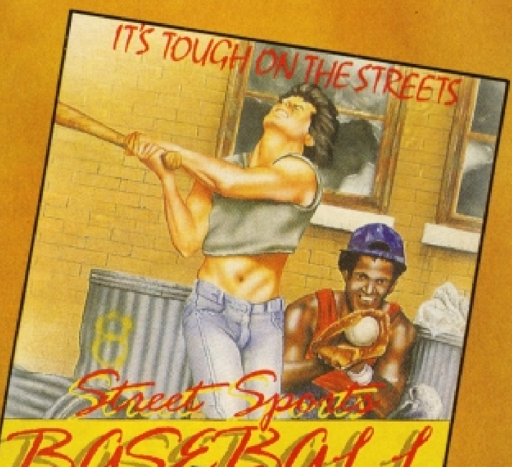
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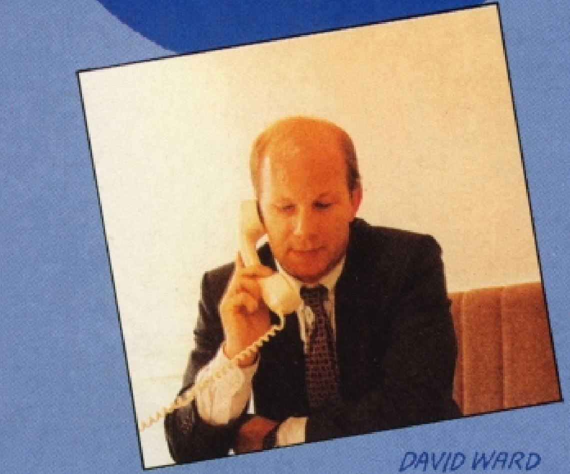

DAVID WARD

"People don't think that we deserve the success we have had." said David Ward, the boss of Ocean. He may be right. There is rarely expressed a great deal of admiration for Ocean, a company that has nevertheless established itself as unquestionably one of the very top echelon of games software houses on a worldwide scale. Some of Ocean's less distinguished products — like the ill-fated Knight Rider — seem to have attracted more attention than many of its big successes. It is a company that is possibly seen as better at marketing than creating; heavy on promotion, light on creativity.

David Ward and the Ocean team would be prepared to admit that there might have been ome justification for that accusation in the past but today?... Well, that was then and this is now... Today, the emphasis is changing toward bringing out the kind of game that wins friends and influences games buyers by the power of playability the skill of programming and through concentration on ideas that will capture a huge chart topping game audience — and perhaps at the same time, a reputation for quality that cannot be denied...

So Ocean invited CCI to its Manchester bas and gave it free rein to wander through and tal to the people at the heart of its organisation — th programmers. It was a brave step for many of th games that were being worked on were sti unfinished and plenty of problems were still to b solved. That state doesn't always give the bes impression of a game to a visitor who might no realise that what is being shown is going to en up very different after the obstacles are overcom

It is also fairly courageous because with th Press talking to programmers, work does not ge advanced much that day — and if you knew th pressure to finish games by the scheduled dat in this case by the year's end to get into th valuable Christmas holiday market — you woul realise what a sacrifice a full day could be.

New Confidence

Ocean calculate that the disadvantages woul be worth it because of the total confidence that i now exudes in its products. By any standards, i has an immensely strong range of products to b launched in the near future. In many cases, it ha already invested far too much in buying th licences even to consider failure. It also has clear understanding that the gamesplayer toda will probably not buy a full-price game in bi numbers unless he recognises the name from a arcade original or some other tie-in film, TV, toy etc. But that alone is not enough and the gam itself must stand up to the toughest competition.

It is worth remembering that CCI's last visit t Ocean was marked by the some of the first sign of this determination to produce somethin special. We commented then on the attentio being paid to one particular game that has sinc then fulfilled Ocean's hopes — Renegade. It ha proven tremendously popular — probably mor so again with the public than the reviewers. It hi the number one position in the charts and staye there.

From what we saw this time, it is clear tha

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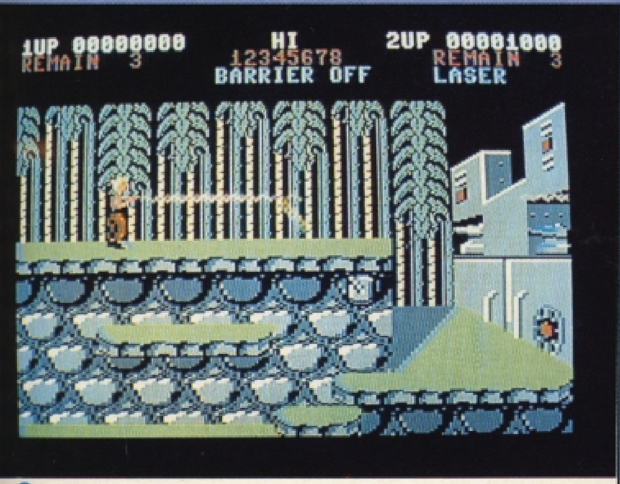
Ocean is sure that it has some games that will outdo even Renegade. It has the vaunted arcade licence Gryzor. Mad balls from Probe Software, and others. Perhaps the most outstanding looks to be Combat School — at least of those slated to hit before the end of the year. It could easily turn out to be the most successful game that Ocean has ever created. We did not see the final version but the sections we have played make it look like one of the very best games of the year — which means, of course, for the 64, of all time. It has the style, magnetism and multiple game playability of say, an Epyx' Winter Games. No one who likes a challenge will, Ocean thinks, probably rightly, be able to resist it.

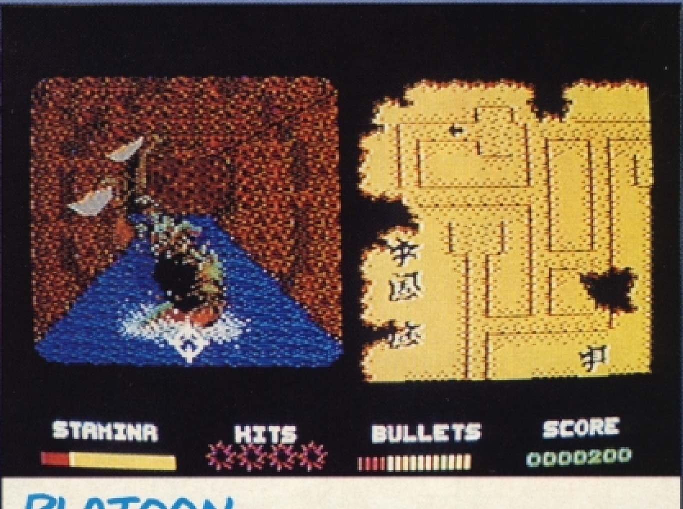
Oscar Winner

Rastan Saga and Flashpoint are two other titles that Ocean sees as booked for worldwide success but it also has an ace up its sleeve that it intends to hold from playing until the beginning of 1988. That is Platoon. Not only was the movie an Oscar winner but the requirements have been that the game the Ocean creates must not be just another shoot 'em up. There is no doubt that Ocean has set itself the task of adding an extra dimension to the usual computer game. They have taken their time, given programmers from their own team greater support and aimed at standards that look more like 16 bit than run-of-the-mill 64.

It has taken more than six months of concentrated teamwork to bring it near completion. It has not been the technical problems that have taken the time but the imagination that has been required to follow the movie story with substantial fidelity. It has been planned like a military operation itself. As Colin Stokes, Ocean's Operations Director says "The one thing that this has highlighted more than any other product we have done is that they have been thinking about the capabilities of the machine... to ts finer points. Instead of going racing ahead and saying "Oh we won't be able to do that now.. or certainly the other machines won't be to.." It's all been planned.. what we can do or why can't we.. the graphics people have had their turn.. "I don't think that looks very good.." In fact, out of all the film endorsements that we have had we think that



GRYZOR...



PLATOON...

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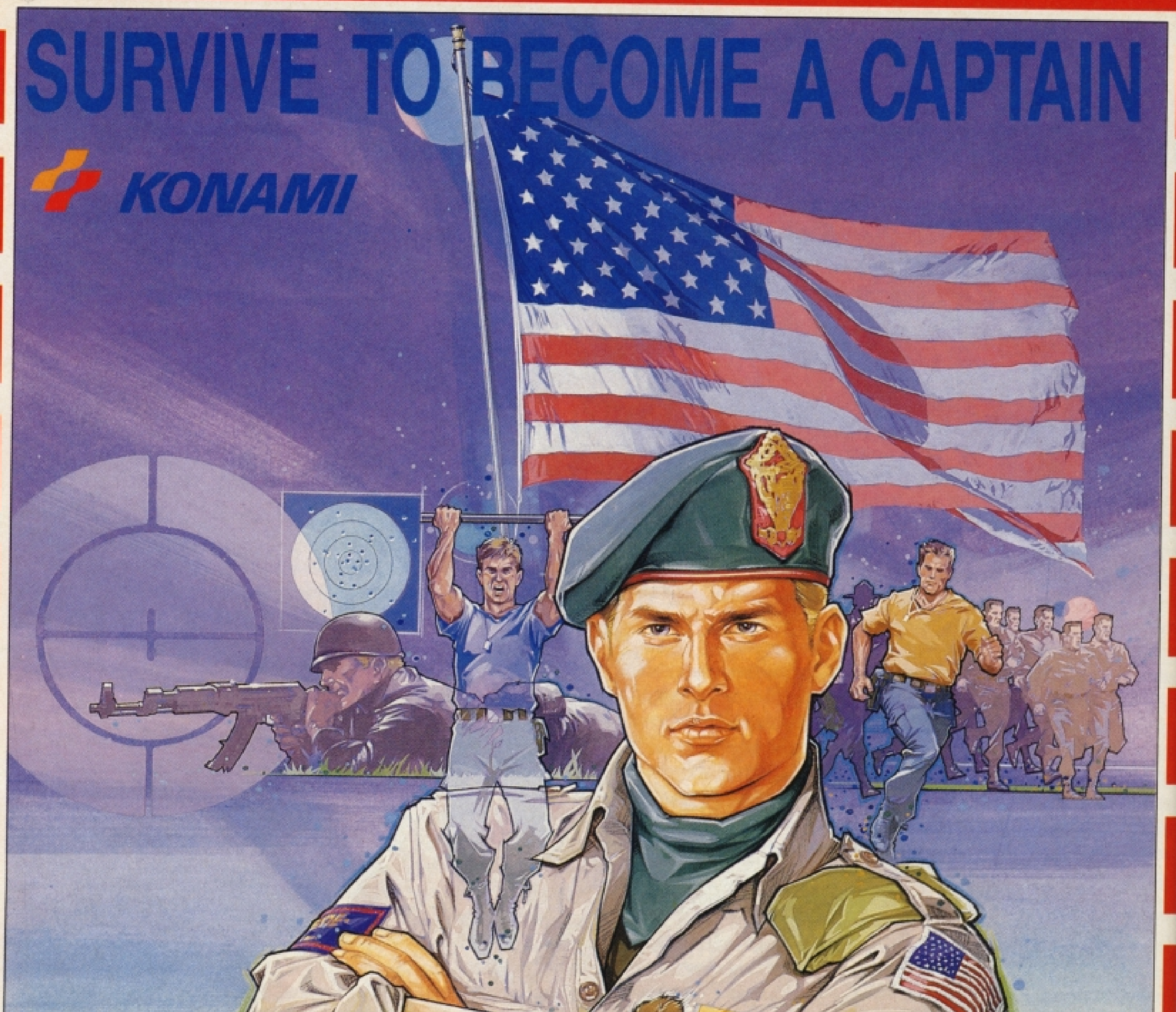
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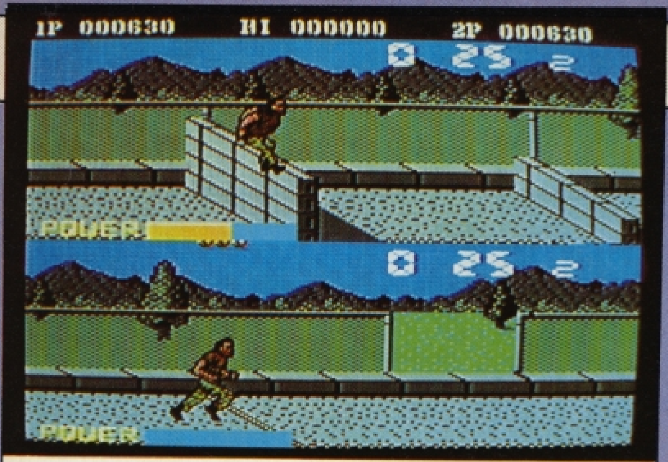


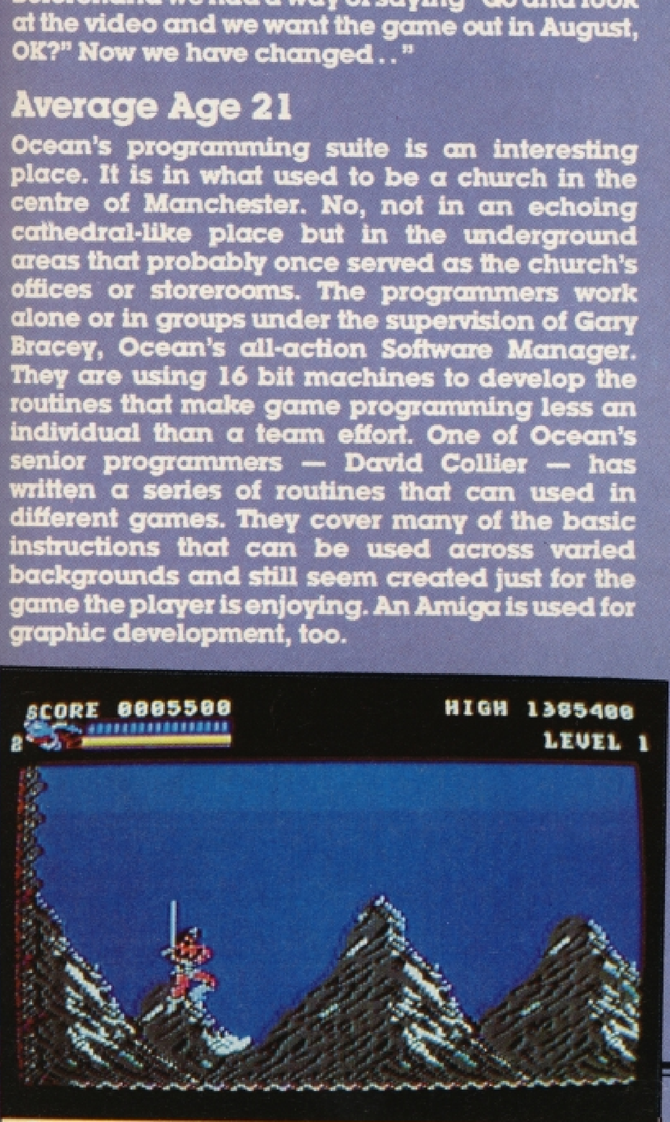
COMBAT SCHOOL . . .

this is the first that is a good representation of what we can do."

The approach to Platoon is a clear sign that Ocean is deadly serious in its intent to step up the quality of its products. How are they doing it? Colin Stokes says "The whole program suite has grown up considerably. . We have learned a lot the hard way with Knight Rider and so on. . What we've managed to do now we didn't do before. . We've given them enough time. . We didn't give enough management to the whole thing. Now we want them to come up with the goods. We don't put any restraints on them. Beforehand we had a way of saying "Go and look at the video and we want the game out in August, OK?" Now we have changed. . "

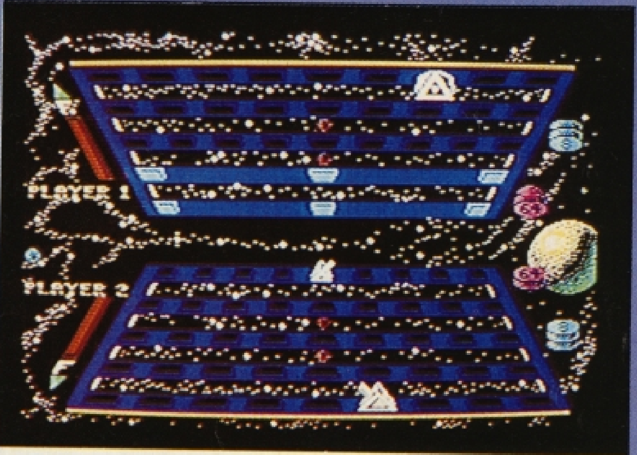
Average Age 21

Ocean's programming suite is an interesting place. It is in what used to be a church in the centre of Manchester. No, not in an echoing cathedral-like place but in the underground areas that probably once served as the church's offices or storerooms. The programmers work alone or in groups under the supervision of Gary Bracey, Ocean's all-action Software Manager. They are using 16 bit machines to develop the routines that make game programming less an individual than a team effort. One of Ocean's senior programmers — David Collier — has written a series of routines that can used in different games. They cover many of the basic instructions that can be used across varied backgrounds and still seem created just for the game the player is enjoying. An Amiga is used for graphic development, too.



RASTAN SAGA . . .

Unusually, Ocean have a girl as a computer graphic artist. The very attractive 20 year old, Jane Lowe started only about a year ago and admits that she had little experience of computers before, though an interest in graphics. Now she is a competent computer user whose talent is clearly being allowed to develop quickly. She is now working on the backgrounds for Gryzor which look stunning already, under the supervision of Ocean's graphics chief Steven Wahid



FLASH POINT . . .

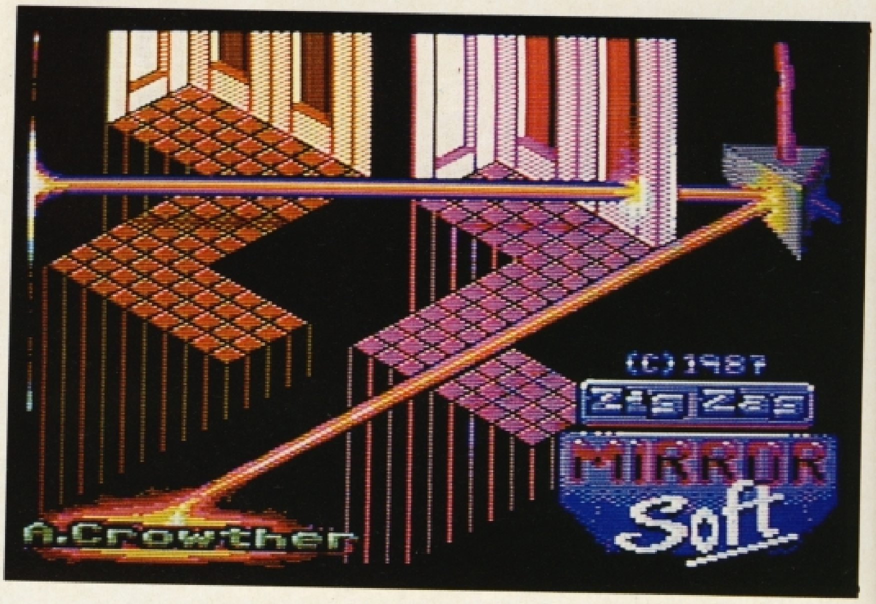
Colin Porch has been at Ocean for three years. His expertise lies not in playing games but solving programming problems. He is working on smoothing the movements of Gryzor and fitting the various gestures of shooting into the complicated sprite actions.

Imagination and Flair

All the programmers are remarkably patient with what must be annoying interruptions to their work. They answer questions good humouredly. The average age must be around 21. This is not the picture of a fun and games outfit that a schoolboy programmer might have. It is not a case of sitting around on the floor with armchairs tipped Big Mac papers and coke cans strewn about, arguing over the best games and boasting about high scores. This is a quiet, highly-professional looking organisation. It produces software. It solves technical problems. But the software it originates has one major difference from the programs that are written to run factories or work out insurance policies or let you take money out of the wall of a bank. They are games which need imagination and flair. Ocean is now providing the firmly organised structure to enable its programmers to have the time, use their wide resources and let that imagination and flair free to create the exciting games that you will want to play — and go on playing. With a whole heavy range of games about to hit the streets including Flashpoint, Gryzor, Madballs, Combat School and Platoon, it looks to be in the best position ever to gain at last the credit for the success it seems certain to achieve.

C64

MEGA



Zig Zag — Mirrorsoft

Tony Crowther's latest games haven't been much to shout about have they? In fact, I went as far as to single him out as one of the time's overrated programmers. All that's behind him now because of his latest game, Zig Zag.

Fronted by some professional credits and a clever bit of wavery colour cycling, the game gets off to a good start. The idea of the game is to get from one corner of a maze to the opposite corner. The maze is shown in smooth scrolling 3D, rather like a multi-directional Zaxxon.

You have control of a craft that travels at a constant speed, and has the ability to fly up to a limited height, and move left and right. This craft cannot, however, turn corners, and this is where the brain taxation starts. At various points in the maze are prisms. Without using these, you'll end up going round in circles.

Near the start, prisms are in abundance, and getting around the maze is fairly easy. Exploring further, you'll find yourself bumping into dead ends all over the place. "Surely there must be a prism there?" you think. Dotted around the maze are small switches on the ground. Fly at low level over these, and the layout will change. A dead end may open up, or a handy prism could materialise.

The effects of these switches are often not noticable if they change something a fair way on into the maze. Each switch and prism has been carefully placed so as to give progressive assualt on the old grey matter (good news for those who enjoy a bit of puzzleability with their playability.)

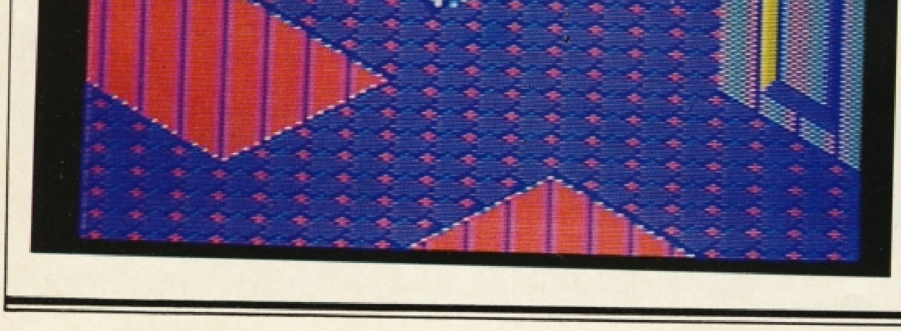
Flying round a maze bouncing off prisms may not sound too great, but of course, there are the aliens. Your craft is armed with a single shot laser which deals with lairy aliens, but some more powerful weapons would come in handy. At the local corner shop, you can spend your cash, which you've earnt from shooting aliens, on U-turns, missiles, smart bombs, sheilds, maps, extra lives, infra-red torches and other goodies.

The size of the maze is impressive. When I was shown a map of it I thought it was a continental quilt (it's big)!

Its in-game graphics aren't particularly impressive, but there are some excellent title screen effects. The music has some nice sounds, but could be a bit more catchy. The whole game reminded me of US Gold's mediocre Deceptor, although this is better, and has a similar graphic style and similar sound effects which are very good.

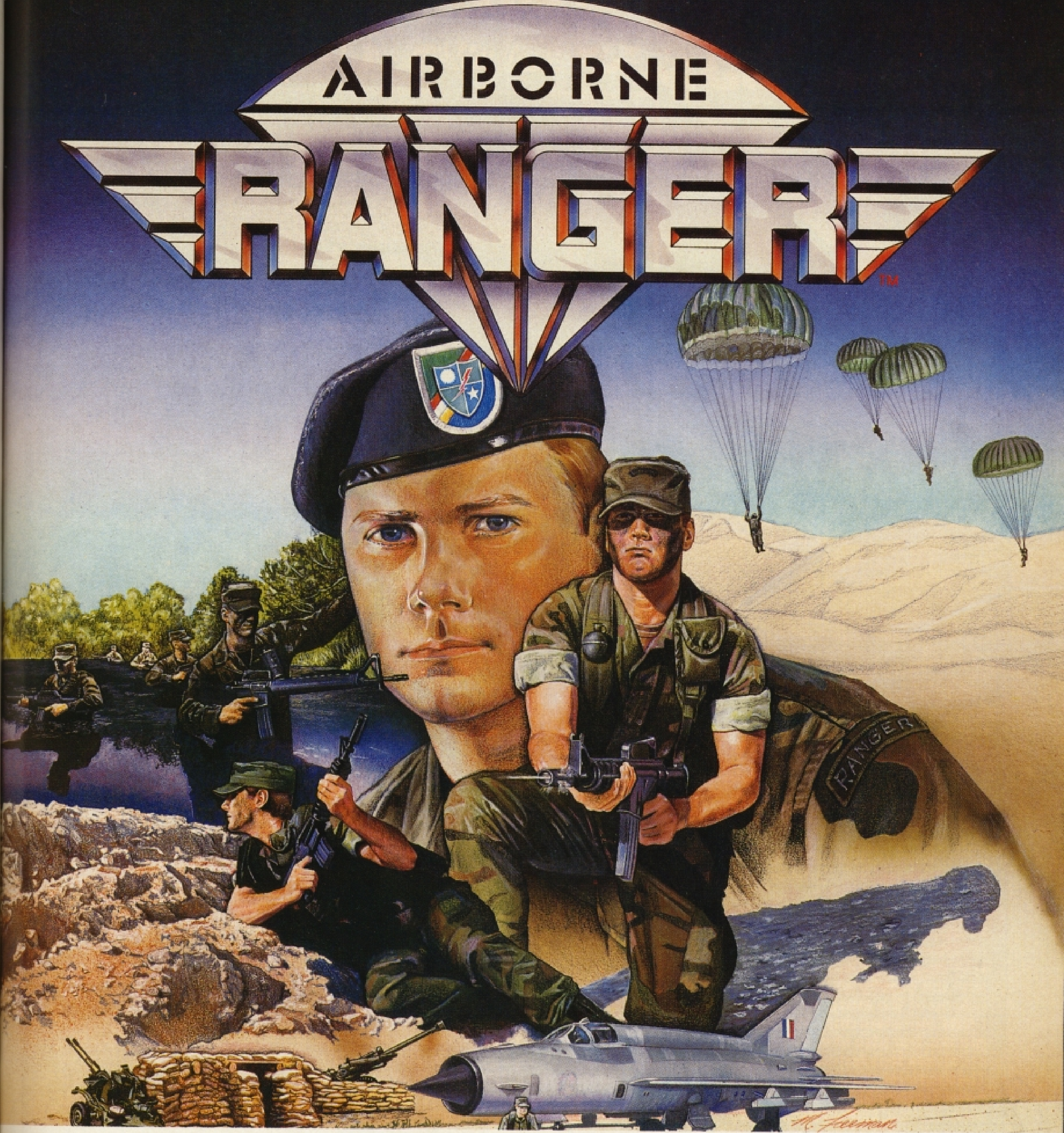
It's hard to categorise Zig Zag. It's not just a shoot 'em up, but incorporates an element of puzzle.

I wouldn't call Zig Zag amazing, superb, astounding or even megabrilltiod, but I will call it original and fun.



Graphics: 79%
Sound: 85%
Playability: 79%
Rating: MEGA
Price: (c) £9.95 (d) £12.95

THE ACTION—SIMULATION



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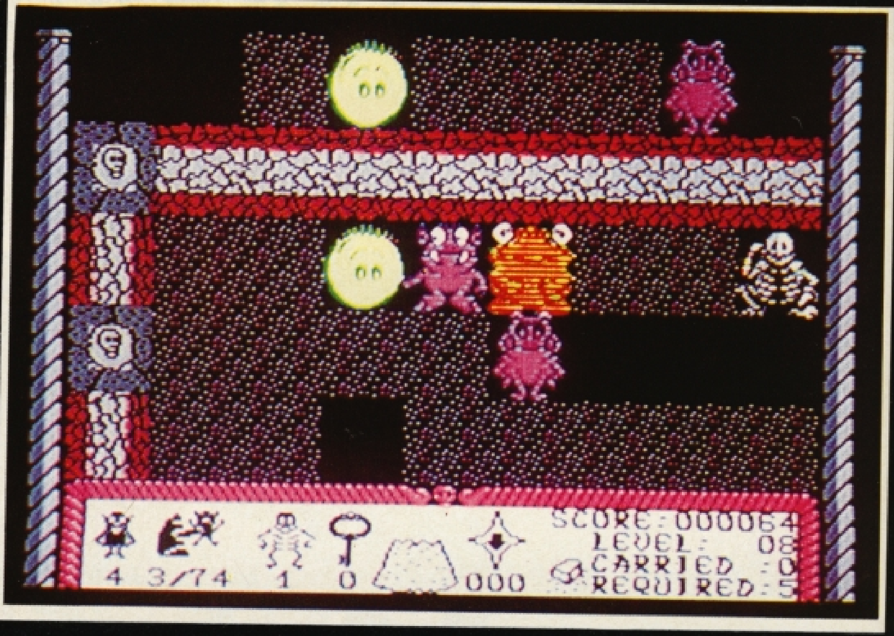
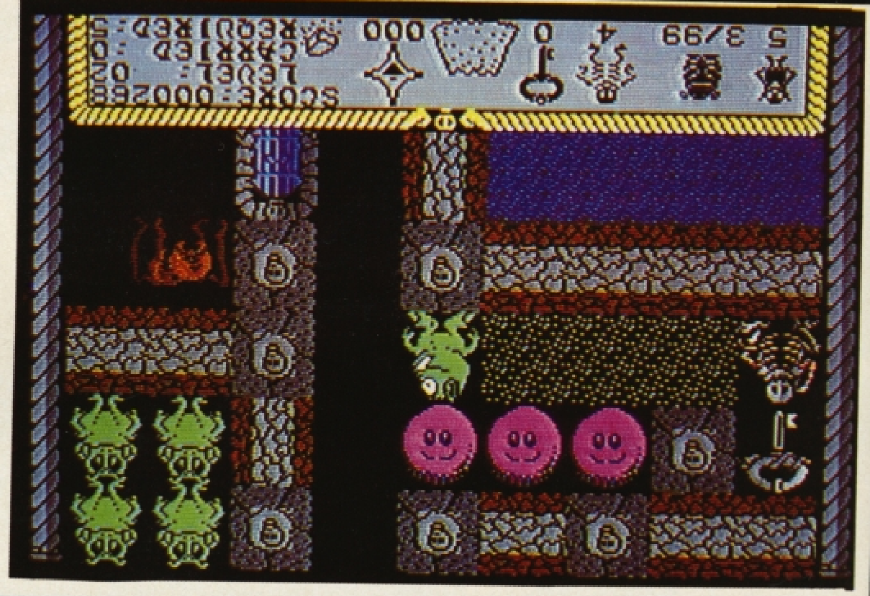
MEGAREVIEW

MEGA





Bone Cruncher — Superior Software

Boulderdash was one of the most highly acclaimed games ever to appear on the 64. It's now even got an arcade version, so it's hardly surprising that so many have imitated its concept. The latest of these is Superior's Bone Cruncher.

The novel storyline to the game is that you, a small flat green dragon, make your living by selling soap to the monsters that bathe in the sea surrounding your castle. This is no ordinary castle, as most of the rooms and corridors are filled with earth. It seems that no-one has put a duster round the castle for years, as it's full of spiders. A couple of other nasties can be found in the shape of small monsters and glooks.

The game is played in a number of four-way scrolling mazes. Your character can walk through areas filled with earth, and they will then disappear. You (the dragon) aren't affected by gravity, nor is anything else apart from the glooks. To start with the gravity will pull down.

Around the maze you find lots of nasty monsters and obstinate glooks, but also skeletons of creatures less fortunate than you. These skeletons are a valuable asset as they form the basis of your soap recipe. Five skeletons are needed to make one bar of soap big enough for a giant monster. Skeletons on their own are no good, they need to be boiled in a cauldron to turn them into soap. When you have a bar of soap, you must find the nearest flight of steps which will lead to a bathing giant monster. Exiting back to the maze will start a timer which, when it reaches zero, will signify a change in direction of gravity. All the glooks in the current level will be drawn towards the bathing monster. This fact gives rise to some progressively tricky puzzles.

The first level is straight forward. Collect the bones, boil them up and find the monsters. Later levels are tougher on the brain and require some thought to avoid being trapped or squashed. Each level has a password, and one completed, it will be revealed. Typing in the password on the title screen will start the game from that level.

The graphics look very attractive, indeed with large well-designed sprites and some hi-res multi-coloured sprites, but these are spoilt just a little by the slightly jerky 8-pixel background scrolling.

A cheeky piece of music plays in the background, but becomes a bit annoying after a while.

To play, I still prefer Boulderdash, but the bold bright graphics will appeal to many, perhaps more to younger players or those new to the 64. Although it may not be greatly superior to the original Boulderdash, its graphics give it an exceptional quality and it is undoubtedly a highly enjoyable and well — presented game. Recommended.

B.V.

Graphics: 87%
Sound: 78%
Playability: 77%
Overall: 79%
Price: £9.95 (c)
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Rating: MEGA

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301

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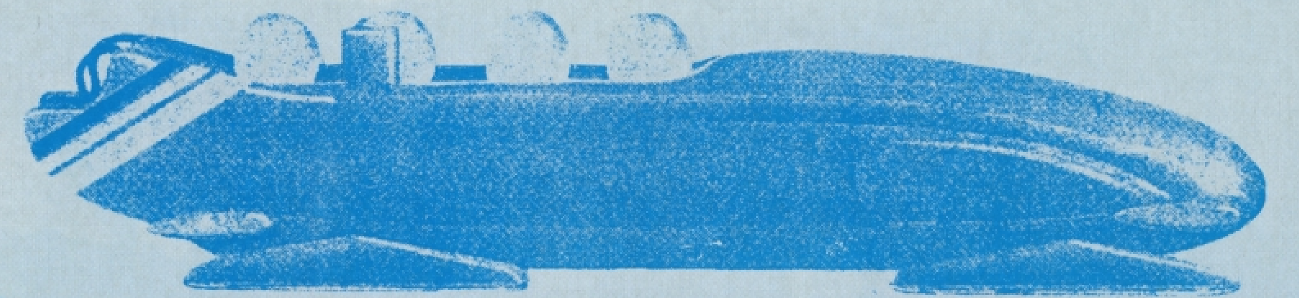
MEGAREVIEW



BOBSLEIGH

Bobsleigh — Digital Integration

When Digital Integration do something, they never do it by halves. Their reputation for simulations has been achieved by getting as close to the real thing as is possible on a home computer. They have built up growing band of loyal fans who believe that a D.I. simulation does not stop being entertaining but lasts for months. There are people *still* playing Tomahawk... Bobsleigh, their latest, is a good example of their work. They have picked what must be the most dangerous and breathtaking of sports. They have gone into the sport deeply enough to get what amounts to sponsorship from the British Bobsleigh Association, which speaks for itself in the question of accuracy and authenticity of their simulation.

They have developed the game not just as a straight simulation imitating the movements needed to keep your bobsleigh on the fast and icy track but brought into it a number of aspects of bobsleigh team management which considerably add to the appreciation and enjoyment of the whole winter sports scene.

Your aim is to reach the Olympics and, of course, go for the gold medal once you get there. To get to the Olympics you have to get hold of an Olympic class bob and these are, as in real life, very expensive. So you'll have to win loads of races before you receive enough sponsorship to buy one. There are all sorts of complications like sponsor's cash limits or just racing at one venue too. As time goes on you can buy more expensive bobs which will go faster but the cost are higher too so you have to watch out you don't go bankrupt!

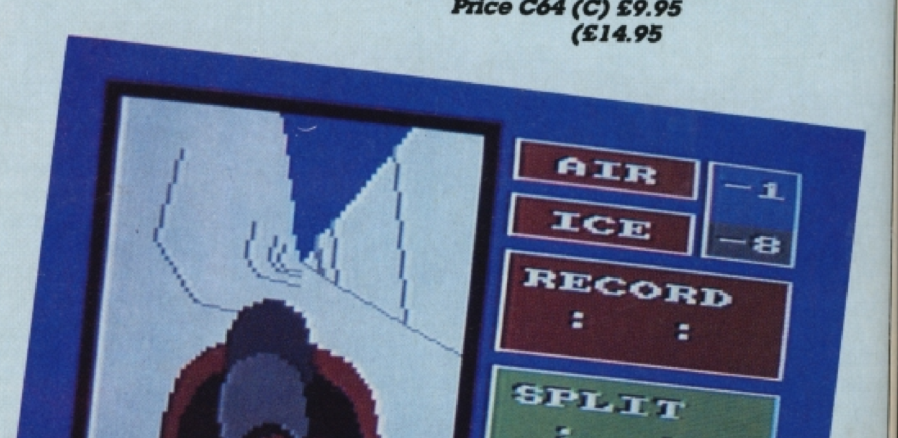
There are four classes of bob from amateur up to Olympic and each class is available in two or four man bobs. Though the 4 man is faster it costs more to run so you've got the same problem of balancing costs against speed.

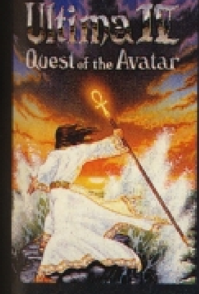
Don't think that this simulation is all about strategic decisions. It isn't. The main part is the actual speed at which you can drive the bob. That depends on how fast you can waggle your joystick. You have to get a fast push start, that is vital. That's a joystick waggling task too. Don't make abrupt joystick moves when you are steering. I did at first and ended up smashed against the icy walls. You will get practiced in picking out the fastest natural lines through the corners. And checks to make sure your runners on the bob are suitable for the temperature or you won't grip the ice properly and you'll be in trouble. When — if — you finally get to the Olympics, you have just two runs to try to get the best accumulated time and the gold medal.

As usual Digital Integration have come up with something special. Bobsleigh combines the challenge of a game in which your skill with a joystick is vital with the demands that are made on any sportsman outside of the actual sport in which he is taking part. Nobody is going to finish Bobsleigh very quickly and when they do finish it they are likely to be so stimulated that they will want to try again to better the first performance. You can't say better than that for a simulation, even a Digital Integration simulation can you?

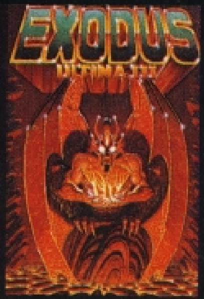
A.M.

Rating: MEGA
Price C64 (C) £9.95
(£14.95



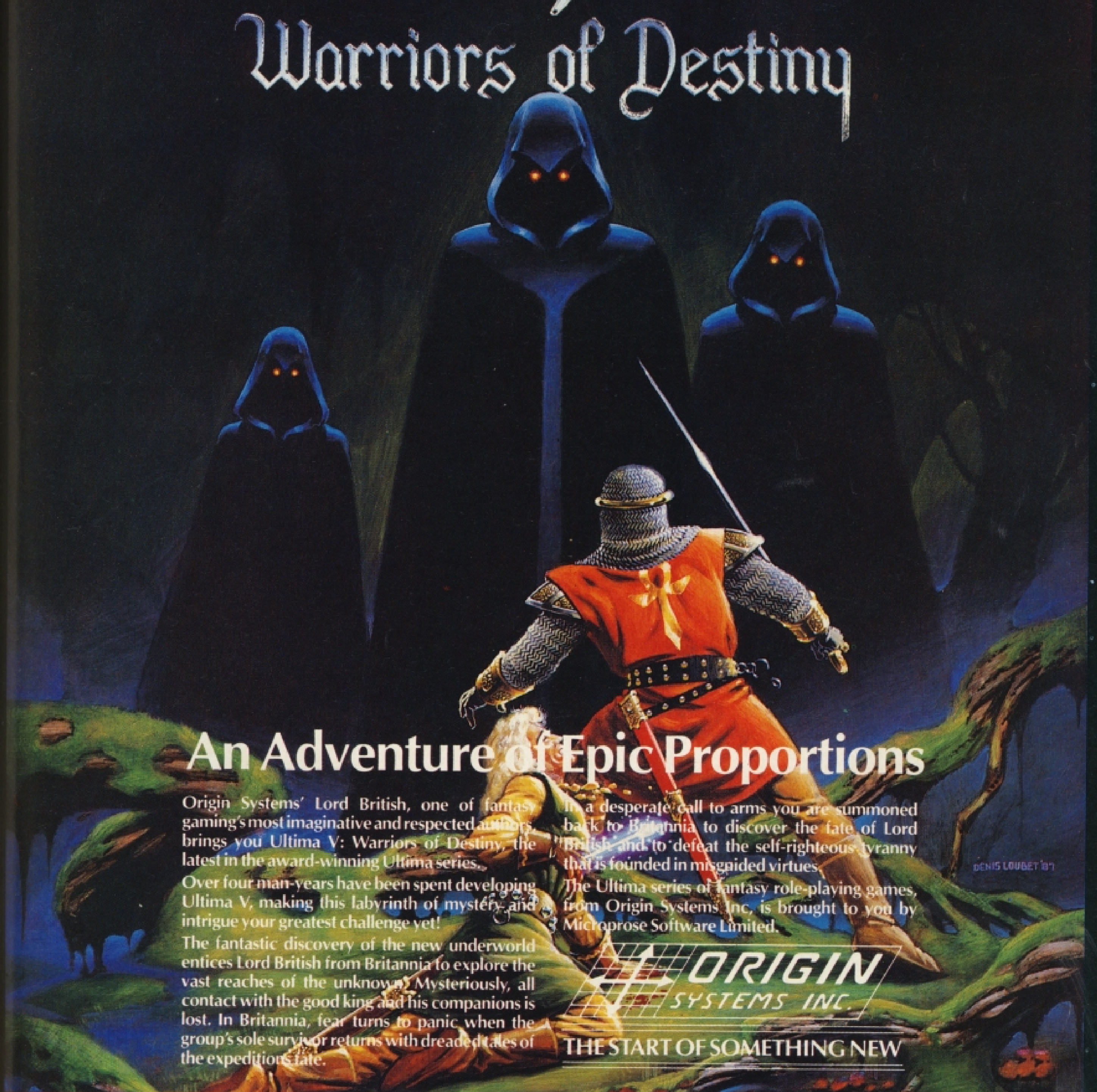


The latest adventure in the award winning Ultima saga



Ultima V

Warriors of Destiny



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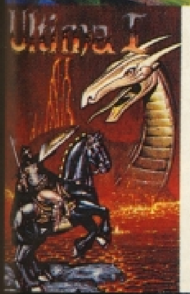

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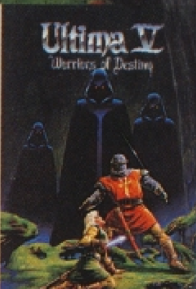
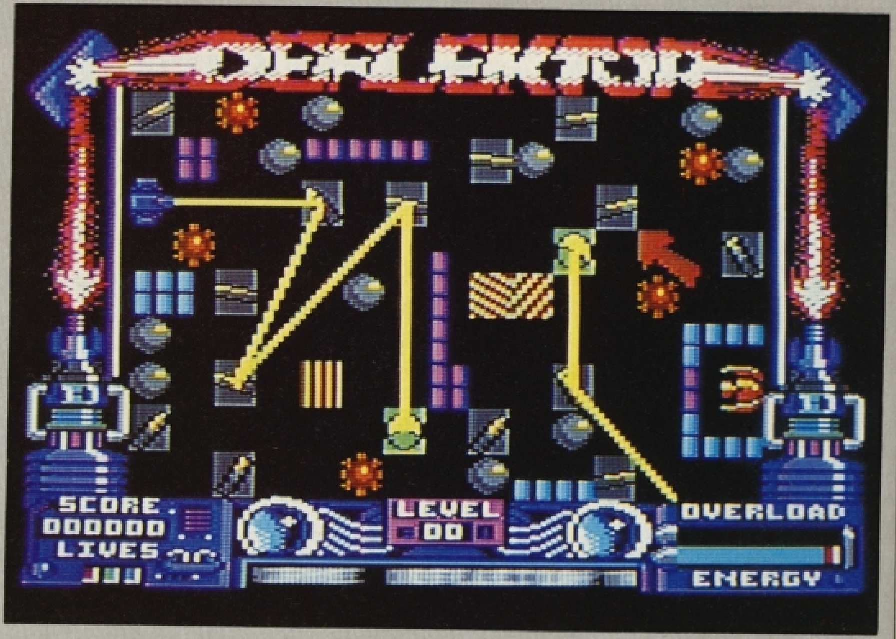
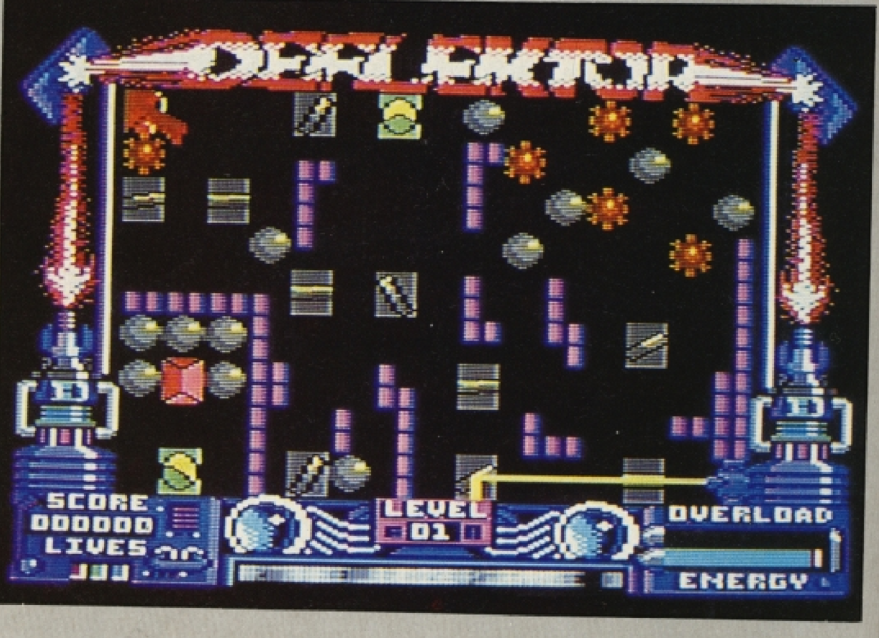


Each Ultima game is a self-contained fantasy, requiring no experience of the other Ultima games. For your copy or a free catalogue, complete and post the coupon to the address shown.

C64

CRISP





Deflektor — Gremlin

What's this? Where are all the aliens to zap, the progressive firepower, the scrolly background, the constant laser fire . . . hold on a minute, there is a big laser, but none of the other things.

Believe it or not, this latest Gremlin game is not a sequel, and involves no bouncing whatsoever. Incredible, but true. Deflector has a very simple objective, to guide a laser from its source into a receiver. Each of the 60 levels is made up of a screenful of mirrors, bombs, optic-fibres, walls and the laser and its receiver.

To direct the laser, the mirrors must be turned to the correct angle so as to deflect the beam around the screen and into the receiver. If the beam passes through an optic-fibre it will continue in the same direction, but will emerge from a corresponding optic-fibre point.

Dotted around each screen are brown flowery things. If the laser touches one of these, the overload meter rises. Failing to adjust the laser's position will mean one less life for poor old you.

Each screen must be completed within a time limit, represented by an energy bar that constantly shortens. In later levels, more hazards are introduced, and mirrors that revolve out of your control have to be used.

The graphics in the game are colourful, but simple with a nice screen surround. Ben Daglish's music is typical of his work, with familiar sounds. Though technically respectable, the tune isn't one I'd put through my stereo, but then a lot of his better stuff wasn't written for games like this.

Deflektor won't amaze anyone, it's not that sort of game, but it can be fun solving the tricky puzzles set by the game and with some 60 levels to climb through there is more than enough to occupy a whole family for months! This is an enjoyable game, I can't see it winning any medals, but it's nice to see something that's really different from alien zapping. Well done Gremlin!

T.H.

Graphics: 76%
Sound: 72%
Playability: 69%
RATING: CRISP
Price: £9.99 (c)
£14.99 (d)

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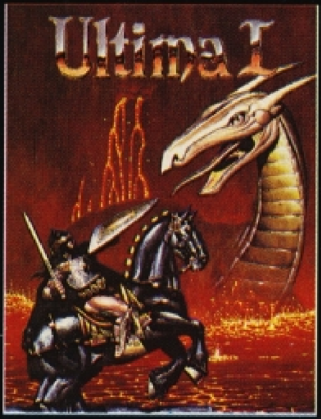

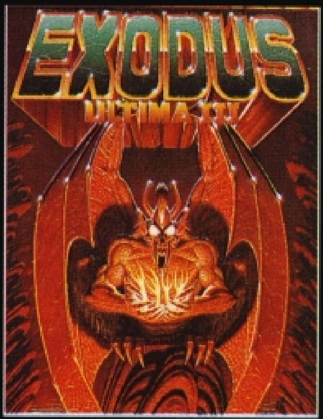
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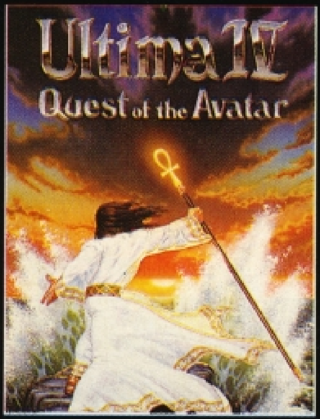
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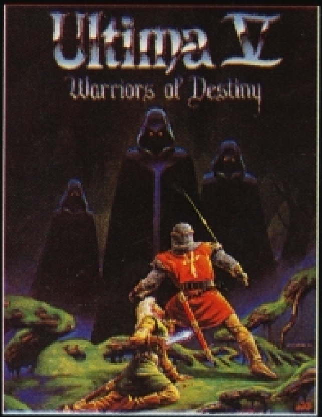
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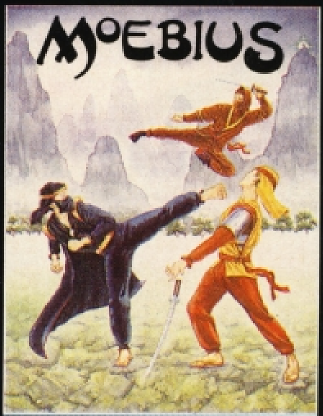

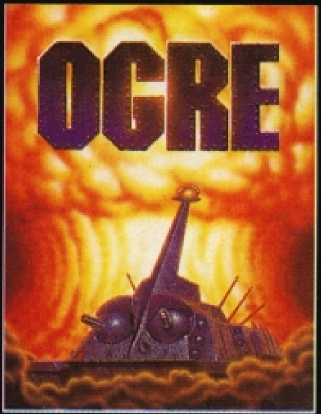

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C64

AWESOME

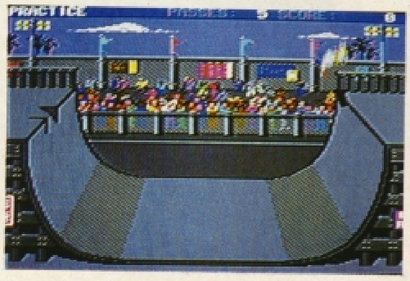
Skate or Die! — Electronic Arts

Skateboarding is back, and to prove it, no less than three skate games are about to be released. Epyx' California Games, US Gold's 720 and Electronic Arts' Skate or Die!. The words "Skate or Die!" will be familiar to anyone who's played the coin-op 720; but the game Skate or Die has taken an original view of skateboarding, and not simply copied 720:

The game begins in Rodney's skate shop. Rodney is an ageing tatooed punk. Moving the cursor around the shop provokes different comments from Rodney, such as "What are you staring at?", or more helpfully, "Sign here if you wanna compete". It's really a very attractive options screen. Select compete or practice, and the view changes to outside the shop. Roads lead off to different areas of the game, and skating down the appropriate one will select that event.

A litle bit of bad news here: each event is loaded separately, but this is only because of the amount of detail in each.

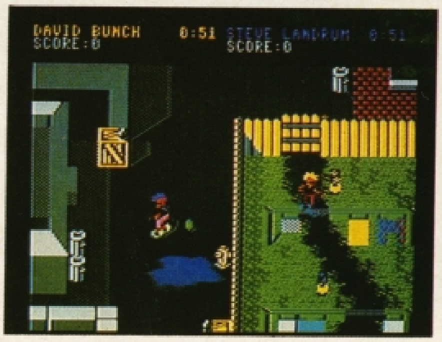
The first and best event is freestyle. This is played on a half pipe in a similar fashion to the skateboard event in California Games. Seven moves are available: kickturn, rock-n-roll, footplant, rail slide, handplant ollie air and aerial. Each of these moves can be modified, with the player deciding how long, high or simply how rad they are.



Graphics and animation in this section are excellent. Time an aerial wrongly and you'll end up splatted on the ground!

A giant ruler is positioned on the right of the half pipe. Drop in, and get waggling! Only four passes are allowed here, so you'd better build up some speed pretty quick. A height indicator clocks up your performance, and if you're on to a good 'un, a press of the fire button will stretch that board a few inches higher.

No. 3 is the Downhill race. First, choose from two types of control, regular or goofy. Adjust your shades and get going. This is a race against the clock, down a sloping path in the local park. The course is laid out with flags, but they're only for bottle-jobs. The course has some mean obstacles such as ramps, road blocks, a pipe, drains, a pond, and even a pavillion which only the most hard-core skaters will ride.



The screen scrolls smoothly as you make your way down the course. Controlling your skater can be tricky as he can speed up, slow down, turn at two speeds, jump and duck, all from the joystick. As before, the graphics, the sprite especially, are excellent. The many frames of animation of the main sprite make it look and play much more realistically.

Jam's next. If you thought you were eating dirt too much in the last event, just wait till you play the jam. The idea is to reach the end of the alley before your opponent. He can be another player, or Lester who's controlled by the computer.

This is rather more violent than the other events. Both players can now punch and kick each other off their boards. Skating down the alley you'll come across crates, bins, cans, bottles, flower pots, open manholes and the buildings on either side. A couple of fences can be very hard to avoid. Skate through one of these, and you'll come out as chips!

The jam tends to be a slower game than the others, but is great fun pulling off 360's over a speed ramp before giving your opponent a kick in the guts.

Finally, there's the pool joust. This is the weakest of the events. Two skaters are pitted against each other in a swimming pool. Your opponent can be choosen from a list of three, each with increasing skill. One skater is armed with a boffer, and gets five passes to boff his opponent. If after five passes, no-one has been boffed, the boffer changes hands, and the roles are reversed.

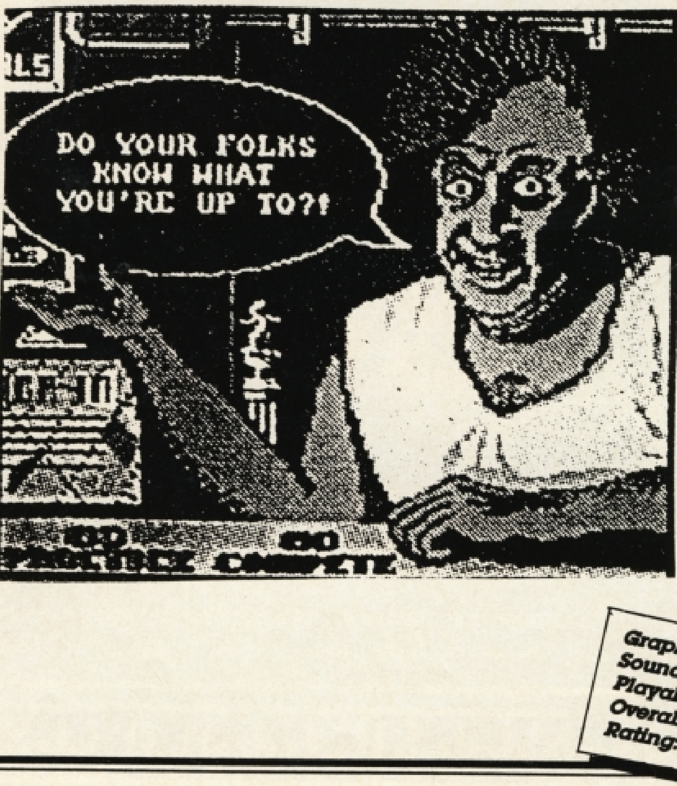
Graphically, this event isn't as good as the others, partly because of the sprites which aren't as detailed, and partly due to the shading on the pool which gives a rather messy impression.

The game can be played by up to eight players can compete in one or all of the events, or they can be practised as many times as you like.

Unlike some skate games which may still be fun to play, Skate or Die is a realistic simulation of skateboarding and so will be appreciated by gamers and skaters alike. (Nick the office skate freak went bananas and screamed 'NAD' about a million times at this!)

The version reviewed here was disk based, but it seems unlikely seriously to impare a cassette version. Skate or Die is an excellent game which I can recommend without any hesitation. Buy it!

T.H.



Graphics: 93%
Sound: 78%
Playability: 94%
Overall: 92%
Rating: AWESOME

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US Gold's — Trendite Tasters

Trendy California types are being well catered for at the moment, with California Games, and two new titles in the shape of conversions from the arcade machines Out Run and 720; both scheduled for an end of year release.

Does Out Run really need any introduction? If it does, you're in desperate need of help. If you haven't played Out Run, you haven't lived. This has to be the ultimate road race game (unless Sega bring out Out Run II of course). Starting on coconut beach, tune your radio, raise an eyebrow at your blonde girlfriend in the passenger seat, rev your engine and you're off! Roadside buildings and palm trees wizz past, as you weave between juggernauts, Porches and beetles, with the bass line of the superb music pounding through the back of your seat. All this is topped by the movement of the cabinet as you turn corners.

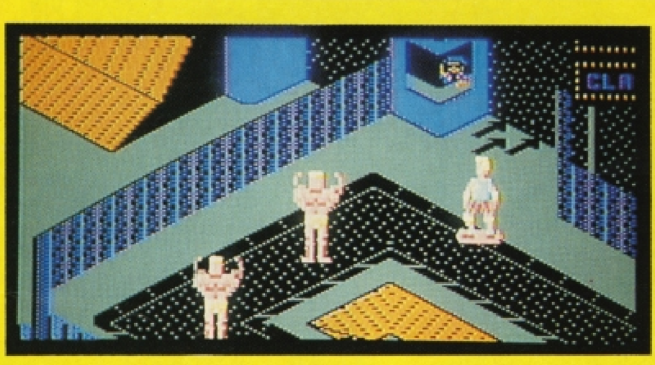
That, of course is the arcade version, but what can we expect from the 64? After all, the 64 does have rather inferior hardware to that of Arcade machine Out Run (to say the least). The version we saw still had a fair way to go before it'll be ready for the shops. What there was, was enough to demonstrate its speed. How it plays, we'll have to wait and see. The three pieces of music from the original have been written into the game, and in addition, an audio recording will come with every game, so you can play it with the real music blaring out your stereo. It looks set to go straight to number one in the charts.

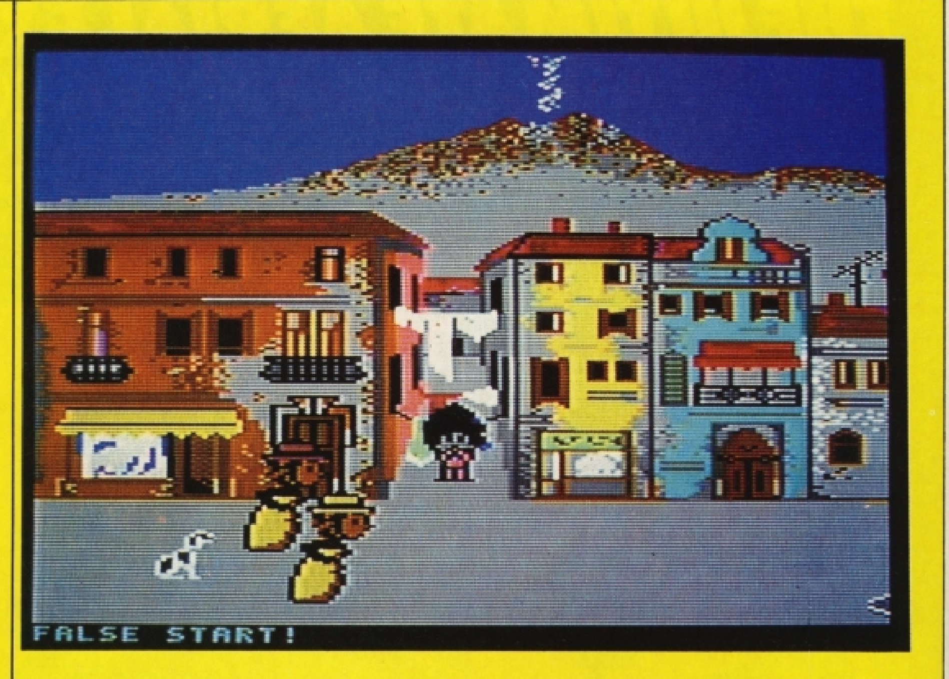
720; another major coin-op conversion has beén a proved a favourite in the arcades, especially amongst real skaters. The game is a skateboard simulation set in a futuristic skater's heaven. Some incredible moves are possible after practice, and this is its main attraction to skaters.

The coin-op version is controlled by a strange joystick that is rotated in the direction you want the skater to turn. The control method on the 64 version is obviously going to be different, but apart from that, it has great potential. Once again, the version we saw was a way from being finished, but it could well end up one of the best conversions to date. Whether it will or not, only time, and a finished version, will tell.

An audio soundtrack of the coin-op version will also be supplied with 720; and both games will sell for £9.99 on cassette, and surprisingly cheaply £11.99 on disk.

T.H.





Preview ALTERNATIVE WORLD GAMES —Gremlin

Epyx World Games seems a bit of a strange choice upon which to base a spoof game, as it's a game with an excellent sense of humour in the first place. It may be weird, but that's what Gremlin have done. Alternative World Games is collector of eight silly events. These are sack racking, plate piling, boot throwing, river jumping, pole climbing, running up the wall, pillow fighting and pogo sticking.

The game will feature a clever and original game selection sequence in the form of video screens dipicting an animation from the selected event.

Each event is set in a different location from around the world, but with little or nothing to do with the corresponding events. Though the pillow fight is extremely effectively done on a gondola in Venice with first class graphics.

Featuring cute characters, yapping doggies, parrots and other such things worthy of a chortle or two, Gremlin go as far as to say that Alternative World Games will have you in stitches. Watch this pace for a full review . . .

T.H.

Take a smash hit all action game (Trailblazer), add a vicious firespitting dragon, a sprinkling of gruesome aliens, a weird selection of trees and silver frisbies, arm yourself with a photon lazer, shake it all up and find yourself on…

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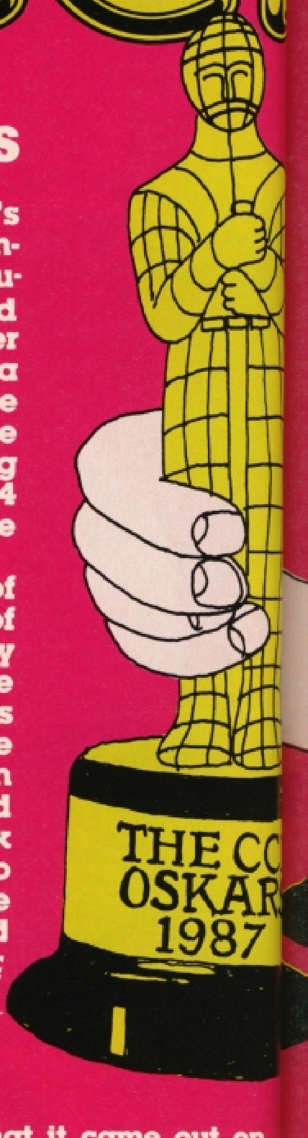
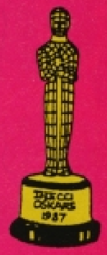
THE CC

Oskars 1987 – The Megastars

1987... The last great year for the world's biggest selling computer? Well, the Commodore 64 showed less sign of dying than many thought would happen. It was not in any way threatened by the 128 which while successful worldwide has never achieved the level of software support to make it a general standard for the mass machine. And the Amiga, although taking a strong step forward with the introduction of the A500, has taken its time in gathering momentum, especially in the games area. So the 64 retained its dominant position. Nevertheless, there were changes that were highly significant.

The major development of the year was the growth of the budget labels and their increasing number of younger fans. In the sheer quantity of games sold they now far out distance even the biggest fullprice software companies. Yet it can be argued that the budget labels contribute very little to the real quality of the software world. They either develop their own titles which, in general, have as small a quantity of work and originality in them that the buyer will stand or they pick up older games that have already had the chance to gain a public. That is why there are so few of them in the CCI Oskars. The real quality of the year has emerged from lots of money and time being spent in creating





Arcade Game of the Year

The final contenders were Gauntlet — yes we know that it came out on December 17th 1986 but that was too late to be considered last year and anyway it stayed at the top of the charts for months in 1987... Wizball, the exceptional Ocean hit and Mega Apocalypse, Martech's sensational smash. Gauntlet was great — but it was not entirely original as both the others were. Wizball was without question something very special but for power-packed, pure super-nova sized explosive force, Martech took the prize for the second year running — with Mega Apocalypse.

Oskar Winner: Mega Apocalypse — Martech

THE CCI
OSKARS
1987

Arcade/Adventure of the Year

We came down to two outstanding finalist — System 3's Last Ninja and Gremlin's Auf Wiedersehen Monty. "Ninja" was a terrific example of the skill that its creators have built up in marital arts sytle games but it could be therefore accused of being derivative of previous material. The same charge could, of course, be levelled at "Monty" — which also had predecessor... However Aufwiedersehen Monty was not only a formidable example of the expertise that Gremlin has built up but was in most people's opinion far superior to the previous "Monty" and that was one of the reasons — and because it was amazing fun to play that "Monty" (Is it really "Goodbye"?) gets the choice.

Oskar Winner: Aufwiedersehen Monty — Gremlin

OSKARS

THE CCI OSKARS 1987
CCI
ARS
7

outstanding products — and there have been probably higher quality packages coming out of the big companies than ever before have been available on the 64. Ironic that, isn't it? Just when they say that th 64 is on its last legs there seems to be a burst of creativity...

What did that creativity produce? It created a whole series of exceptionally interesting and exciting ideas like Microprose's Pirates, Epyx' California Games, U.S. Gold's Gauntlet and Road Runner, Ocean's Wizball and Arkanoid, Gremlin's Aufwiedersehen Monty, System 3's Last Ninja, Anco's Summer Events, Software Projects Hysteria, Electronic Arts' Skate or Die and Earl Weaver Baseball, Psygnosis' Barbarian and Terrorpods, Micro-Illusion's Faery Tale — and those were only the games... While the rate of introductions slowed for hardware and "serious" software for the 64, there were still plenty of interesting ideas that could be used to benefit the "productivity" side of home computing.

In addition to the growing trend for Amiga products, there was the opposite move to a phasing out of the Plus/4 — C16 field. Fewer and fewer products were appearing and this is thought to be last year that companies will be creating software for those sadly neglected machines. Will we be saying the same about the 64 this time next year or will it still be going strong? Perhaps we should give an Oskar for predicting the future...

Sports Game of the Year

THE CCI OSKARS 1987

The final three contenders were really four — Accolade's Leaderboard had two successful bites at the cherry with World Class and Famous Courses —both great games in their right. U.S. Gold's other American associate Epyx also came up with the superlative California Games. At the last moment, Electronic Arts came in with what the expects say is the best skateboard game yet — Skate or Die! For overall quality and entertaining variety, by just a sunbleached nose, the winner was — California Games.

Oskar Winner: California Games — U.S. Gold/Epyx

Simulation of the Year

THE CCI OSKARS 1987

The growing quality — and the investment of thought and time into the creation of games — was shown in the increase this year of excellent simulations. We chose two from the masters of the genre — Microprose: Gunship and Pirates, the cleve Twin Tornado from Dochersoft, Cascade's follow-up Ace 2 and Digital Solutions excellent talents were well-displayed with Tomahark. For originality, excitement and sheer fun, the one that came out narrowly on top was Microprose's Pirates.

Oskar Winner: Pirates — Microprose

THE CCI OSKARS

THE CCI OSKARS 1987

Role-Playing Game of the Year

The best three here were Electronic Arts' Legacy of the Ancients and Bard's Tale II and Origin's Moebius, which was really a roleplaying adventure category. The award here, we chose Legacy of the Ancients for its original style and well-programmed development.
Oskar Winner: Legacy of the Ancients — Electronic Arts

THE CCI OSKARS 1987

Compilation of the Year

This is a class that was absolutely exceptional. Never before have such amazing value compilations been available. For around ten pounds you could buy 5 really great games from U.S. Gold, including Gauntlet and Leaderboard; 10 very good games from Gremlin and 22 high quality games from Ocean, they all made the budget labels look expensive! For the sheer magic of Infiltrator, Ace of Aces, Winter games plus the other two U.S. Gold chart toppers, the selection goes to — Solid Gold.
Oskar Winner: Solid Gold — U.S. Gold

THE CCI OSKARS 1987

Most Original Game of the Year

Originality abounded this year. FTL's Shockway Rider came upwith something different from the usual shoot'em up. Mirrorsoft's late entry Zig-Zag brought the best from Tony Crowther, U.S. Gold/Accolade's Comic was like nothing that had gone before (and on three disks, too!) Incentive's Driller, using the brilliant new Freescape system jumped games a step into the future and Outlaw's Shoot'em up Construction Kit gave creativity and fun in the same package. It was a hard choice this one but we finally came down to — Driller.
Oskar Winner: Driller — Incentive

THE CCI OSKARS 1987

Best Graphics of the Year

California Games and Wizball enter again here as do U.S. Gold number one Road Runner and Software Projects' remarkable Hysteria. For the sheer daring and style Hysteria it gets the prize.
Oskar Winner: Hysteria — Software Projects

THE CCI OSKARS 1987

Best Music of the Year

Aufwiedersehen Monty, Wizball (again!). Game Over and Last Ninja were the contenders for this one. We thought that Ben Daglish was just pipped by Martin Galway and so the multifaceted Wizball was picked.
Oskar Winner: Wizball — Ocean

THE CCI OSKARS 1987

Budget Game of the Year

Mastertronic's Kickstart II was universally popular ana Codemaster's Lazerforce had a lot of support. We pushed the "game" category a little to include Firebird's Microrythm + which was also excellent value. But the top selling budget house took it with . . . Kickstart II.
Oskar Winner: Kickstart II — Mastertronic

QuickShot
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Performance

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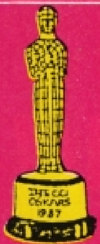
THE CCI OSKARS

THE CCI OSKARS 1987

Adventure of the Year

Rainbird's Guild of Thieves was judged a worthy follow-up to their famous Pawn. Level 9's Knight Orc was a controversial entry with some eager fans and a few opponents. But the matchless Infocom kept them coming and produced the year's wittiest and most amusing adventure challenge with Hollywood Hijinx.

Oskar Winner: Hollywood Hijinx — Infocom



Software Utility of the Year

We were nearly unable to separate some excellent products here — Timeworks Wordwriter, Database's Mini Office II and Fontmaster 128. We chose one for the 64 and one for 128.

Oskar Winners: 64 — Mini-Office II-Database and 128-Fontmaster

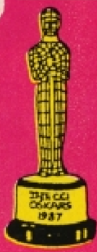
THE CCI OSKARS 1987

Best Hardware Peripheral

There were a number of interesting cartridges but nothing really new on the "freeze" style. What was new was Evesham's neat Slimline case to turn the old C64 into a 64C but our choice for this prize was Timeworks marvellous cartridge Partner which contains eight different desktop accessories.

Oskar Winner: Partner — Timeworks

C16



With the sharp fall in products for the C16-Plus/4 range only five categories merited attention. In each case the winners were standouts in their class.

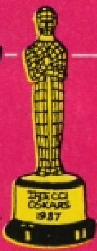
Sports Game of the Year

Oskar Winner: Summer Events — Anco

THE CCI OSKARS 1987

Arcade Adventure of the Year

Oskar Winner: Aufwiedersehen Monty — Gremlin



Adventure of the Year

Oskar Winner: Savage Island — Tynesoft

THE CCI OSKARS 1987

Budget Game of the Year

Oskar Winner: Gwnn — Mastertronic

THE CCI OSKARS 1987

C16 Game of the Year

Phantom — Tynesoft

THE CCI OSKARS

Programmers of the Year

THE CCI OSKARS 1987

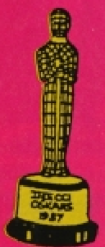
There was plenty of very good programming talent about, especially making the most of the talents of the 64. Gavin Laird, among many other games, produced Lazerforce. Simon Nicol wrote Martech's Mega Apocalypse. Shaun Southern was a very strong contender for his Trailblazer, Kickstart II and a very late runner, Gremlin's stunning Cosmic Causeway. But outstanding over all were the Sensible Software team who created both Wizball and the highly original Shoot 'em Up Construction Set.
Oskar Winner: Sensible Software

Software House of the Year

THE CCI OSKARS 1987

Ocean produced some very quality games and at the end of the year seemed to be moving as fast as anyone. U.S. Gold's massive hand of its own successive number ones like Gauntlet, Leaderboard and Road Runner — with Outrun and Gauntlet II yet to come added to its top class Epyx range and SSI seemed to many to make it the favourite choice. But we always expect great things from the industry leader. There was however one software company that emerged out of relative obscurity to take a major place on the computer game stage — Microprose. Wild Bill Steeley's company produced a comparatively small number of consistently high quality products throughout the year. They are software packages that although they can reach the charts they are in general are longer-lasting than most other games. Microprose dominates a rapidly growing area of computer entertainment — simulations — but it hasn't stopped there. It has taken on associations with others of equally high quality such as Origen — of Ultima fame; and Springboard, specialising in home productivity packages. Microprose is even involved in joysticks and also in other quality software like Geos. It made a tremendous impact with its 'real' simulator at the PCW symbolizing the rising public image it now possesses. For the exciting growth it has shown in Europe under M.D. Stuart Bell, Microprose took the award.

Game of the Year



California Games, Mega Apocalypse, Arkanoid, Auf Wiedersehen Monty, Last Ninja, World Class Leaderboard, Wizball, Skate or Die Gunship, Pirates, Hysteria, Gauntlet — no-one can say that 1987 was short of outstanding entertainment for the computer games player. Those twelve alone would have been enough to play one brilliant game a month for the whole year and there were plenty of others too that deserved attention. One game out of that top-notch selection kept on coming up in many different categories, for sheer allround brilliance in graphics, music; its highly creative progrmming and gameplay we came to the conclusion that it took precedence over the rest of the games of 1987.
Oskar Winner: Wizball — Ocean

See you next year!

SUPER FELIX WISHES YOU ALL A HAPPY 1987 AND

Greek Tragedy

I am announcing the secret launch of a new computer. Its working title which I ask you to reveal to no-one as the machine may not work — is LittleOakTreeSpectrumstradOriCommodoreStamiga PC or for short Plusthreeorfourvictwentysixtyfourandonetwoeight CD. This is undoubtedly going to be the the home and business computer of all time — well, sometime then. It is 8/16/32/64/127/242½ bit machine and each bit comes to you wrapped separately in silver paper. This computer will do anything that any other computer will do at only half the speed and twice the price. You don't need a mouse or a joystick with this machine because there is no joystick port. Think of the money that saves you! This marvel comes absolutely complete. All you need to buy is a Central Processing unit, a large number of chips, a keyboard, a drive, a datasette, and a monitor and a cupboard to put it in. The manual of course comes extra. As does the metal case. However the cardboard box is free (shipping extra). It has a full guarantee for not less then five minutes but I assure you that nothing can possibly go wrong because there is no software to run on it and it has no light to show you if its on. In fact there are no plans to produce any either because we wish for this machine to keep a very special and exclusive niche in the market where only the most exclusive computer people are allowed to enter. (Nobody you know!) It has some amazing advantages that no other computer can claim. It has a built-in washing machine as an optional extra at £450; also a microwave oven for cooking your old software (£560 extra). It is, of course, portable — comes with attached skate board (£275 extra), can be used underwater (Snorkel £321 extra) or on ice (Free skis only £345 extra). You can use it for any game for any other computer (any other computer supplied with it at only twice the recommended retail price.) Best of all, it comes with a full committment from Marks and Felix that if you are not satisfied you can return it at any time — day or night and you will receive in full the envelope you sent your original cheque in. The price is ten million florints (inflation, you know) and it's about time you knew what the hell a florint was anyway.

Archie Meadis is appearing as Clytemnestra in No Sex Tonight Please My Husband is British at the Sinclair Hippodrome, Bognor Regis. Please do not send us back any of these computers that have arrived D.O.A. (Dead On Arrival) in other words not working when you get them because that is the way that they will leave us — it saves time in quality control and they never break down.

Lawrence: in the hot seat

New editor takes over

Computer News has a new editor. Jane Lawrence, former editor of *PC Business World,*

Why do some other mags get all the luck? We have a 200 kilo warlock and Computer News gets the luscious Jane Lawrence. It's not fair! I must have been a human in a previous life to have deserved this! (Another item like this and I'll turn you into a person or even a games reviewer! Anyway She's probably allergic to cats! I certainly am! ED)

ITS BYE-BYE TIME BILLY!
NANNY

Sallying Forth

(Acting) Lieutenant-Colonel Bully Brown has received a letter. He was, of course, delighted even if was addressed, he claims, in error to a certain Ms Sally Moore. The epistle came from a wellknown brand of lawyers — no, not CCI's Snatchit, Grabbit and Run — and addressed him doubtfully as Sir or Madam. It referred to a book that Sally had recently written on Lord Lucan. This noble lord you will remember disappeared when, after showing typical artistocratic intelligence, he appears to have clubbed his children's nanny to death while thinking it was his wife. Very bright, these Lords, dontch-think?

Well, Bully claims the letter is a all a big mistake — like Lord Lucan's — that he, Bully Brown, is not Lord Lucan and he hasn't used the name "Sally" for some years. I'm sure we all believe him but he is, I have heard married, to sixties pop idol Joe Brown, uses an expensive aftershave called "Femme de Ventes" and has a really charming way of fluttering his eyelashes while talking on the phone to advertisers. All contributions to the "I Hated Nanny so I Think Lord Sally Brown Should be Made at Least a Duchess Fund" must be sent by August 12th 1972 to the Hon. Treasurer, Sir Super Felix, C/o The Bank of England Guest House, Guernsey Island, The Bahamas. Joe Brown is 67 and appearing with her Brothers in the stick of rock show "Melted Brown Meshugar" at the Waitrose Theatre, West Hampstead.

Technical Hint

Dear Aunty Felix,

I am having trouble with my 1541 disk drive. It keeps on grunting unpleasantly and acting up. It will only run Robtek's Strip Poker for the Amiga which is embarrassing when the Vicar and my family are here. What should I do?

Yours troubled Rae Cohen

Dear Mrs Cohen,

Why is Robtek's Hollywood Strip Poker embarrassing? Robtek is a perfectly respectable company, Simon Harvey-Bristol-Cream-Headlines told me so personally and he swears that the second darkhaired girl (who can't wait to take her clothes off) is not his mother Nadia Headlines (who has eyes, I'm told for no-one but another Simon — this time a Mega Apocalyptic one — Geddit?). What you may need to do however, is align your drive. This is not a difficult operation. First you insert a heavy screwdriver into the disk entry slot. Make sure you thrust it repeatedly and firmly into the slot. If necessary knocking it in with a hammer. Then you upend the drive and point downward the end which has the words Commodore 1541 (and the protruding screwdriver) and bang it at least ten times on a really hard surface. Please ensure the drive is exactly vertical. Then turn the drive over, hold it by its sides and strike the side of a door frame with the underside of the 1541. Minimum six times until you have got some good dents in it. If you have time repeat the operation against your neighbour's garden gate, so that the sides are well-crushed. Do not unplug the drive from the mains electricity. (This is what is called in technical terms 'Punishing the Drive') you could also try 'cleaning' the heads' by snadpapering them firmly (always use a good quality sandpaper) If your drive goes on acting up, it is clearly stagestruck. Send it for a postgraduate course in Drama at the N.T.S.C Arts Foundation in London. Prof. Max the Ad will soon have it starring in

D A HAPPY 1989 (AND FOR A HAPPY 1988 - PLEASE SEND CHEQUES TO . . .)

the musical version of "Platoon" shortly to tour the "Ocean" circuit of theatres. If you don't want to put your disk drive on the stage, Mrs Cohen, just send it back to Commodore UK and explain that it was a "grey import" and damanged in the mail. They'll be glad to refund the £5000 you paid for it. Next Month 'What to do if your monitor goes Punk or becomes a skatefreak!

Age Can Certainly Wither . . .

I can confidentially reveal to you, faithful reader, that rumours of Our Sacred Editor visiting New York are absolutely true. What? Do I hear you yawn? Shucks, man, yeah Ah Know ya thinks lil' ol' O.S.E. was a-visiting the big ol' Apple that down-home tradition of getting mugged on Broadway or seeing the AmiExpo. Well, it just shows to go how wrong you can be, yes iree. I can reveal tat the real reason he was at the Sheraton Centre was not for some boring Amiga Show but for another much more exciting — and for him appropriate — meetng going on at the Sheraton at the same time. It was the gathering of the American College of Gerontology. Gerontology? Yes, the study of old age, as of course you know. It seems that O.S.E. is 29 coming on 104 years old. (If you ask him, he says he is "29 and holding" — holding onto anything between 17 and 25 he can get hold of.) What interested him at the Sheraton wer not dull old Amiga things like Firepower or Publisher 1000 but "Gene Expression and Aging" (Who is this guy Gene Expression?) by Prof. Kate Williams. And there was the fascinating and entirely suitable for O.S.E. "Aging of the Brain — Recent Advances" I can assure you he's made many advances in that direction recently, there was one piece of light relief from Dr and Mrs Norman Vincent Peale ('The Power of Positive Thinking') entitled "Always Keep It growing". Wow! The mind boggles, doesn't it? All I know that O.S.E. has been shutting himself away, since his return, and gazing into a mirror he's had installed in his office. I wonder what he's looking at or for? Answers to the Kate Williams Fund for Aphrodisiacs Anonymous C/o The College of Health, Watling Road, U.S.A.

Next Month in CCI — "Aging PETS", "Senility and the 128" "Why don't you love me now I'm 64?" (I'm not 29! I've just aged rapidly since you have been here! Any way you're fired, sacked! I'd send you a dismissal notice if I could remember where I left my glasses and the typewriter. Who are you anyway? Ed.)

Read it or Die!
(Or Read it and Die?)

I am starting a new magazine — or rather an old magazine — anyone can start a new magazine. The title will either be My Commodore incorporating Our Commodore incorporting Their Commodore or alternatively Our Commodore incorporating Their Commodore incorporating My Commodore. It will appear on the seventh Thursday of every month with an R in it and will incorporate another magazine called either my 128 or Our64 and Their Vic 20. Every other month — without an R in it — it will incorporate (I just love that word) within its pages (How could it incorporate outside its pages? Ed) yet another magazine called either My Amiga or Our Amiga or Their Amiga or maybe My Amiga incorporating Their Amiga incorporating Our Amiga (Do you think that sounds better?). There will be no advertising but advertisers will be charged at £1300 per page — or 15p if they argue. The new, sorry, old magazine will not sell in newsagents but in chemists as a cure for insomnia and also for those who can't sleep too. Next month in 'My and Our and Their Commodore incorporating His 128 and Her 64 and somebody's Vic 20 and Their Amiga and My Computer and Their Datacassette — Buy it all on disk and go to sleep even more quickly."

Orcward Moment

I suppose you believe that the release of Knight Orc for the 64/128 will interest people like you who are foolish enough to like computers and adventure games. I think it should serve as a dire warning. The word "addictive" is too often used about games these days and this photo shows what happens to innocent people who get addicted and play too long with themselves or against the computer. All sorts of nasty things occur including facial changes. They often grow feathers (hence the expression "Who's that rainbird I saw you with last night?") They also frequently fall into what the medics call "Orcward Positions" from which there is rarely a cure. Level 9's next production is called "Kama Sutra". Ful colour photos of the "Orcward Positions" from this game can be obtained under plain cover, naturally, from the Supine Felix Foundation for Attractive Addicts, c/o Madame Whiplash, Adventure House, Telecom Meadows, Oxford. Adrian Howls and Pete is Austin 7. The price is, of course, 5 million forints (What the hell is a florint anyway?)

IMPORTANT ANNOUNCEMENT

JILL DICK - COMPETITION ENTRANT OF THE CENTURY, (14 ENTRIES TO THE 120D COMP!) HAS WON . . . A FREE CCI T-SHIRT!!

(WRITE AND TELL ME WHAT SIZE BUST ~~ARE~~ HAVE YOU?)

LOVE FELIX xxxx

LOAD AND RUN FOR YOUR LIFE!

WIN AN AMIGA 500!!!!

(What again? How boring! Now if it were a second hand Plus/4 . . .)

Another frighteningly easy competition just so that we can find a home for this lonely Amiga 500. You don't want to bother to enter, do you? It will be far too easy for you . . . You do? Well, that's terribly kind of you. It would be awful if our new competition princess Tessa didn't have a single entry to pull out of the Comp Sack, wouldn't it? So all you have to do is write your name on a postcard and the Amiga 500 is practically yours . . Well, there is the little matter of the questions . . . You don't mind answering those, do you? Just read through this thin, thin magazine and all will be clear (the pages run from 1 to 156 if you see what I mean . . .). The answers are all in the CCI.

1. Who's giving away a radio for a soap opera?
2. How can you buy budget software without going to a shop?
3. What size is CBM's new drive?
4. Who is a notorious Alternative designer?
5. How much does a CCI T Shirt cost?
6. Who is (or are) opionated about shoot 'em ups?
7. Who is the boss of Ocean?
8. Which game entered a chart at number one this month?
9. What is the name of Timeworks' Word Processor?
10. Who used to be interrupted but is finally getting started?
11. In what does Professor Kate Williams specialise?
12. Who is the Software House of the Year?
13. What is the connection between the DTP Show and Mini-Office?
14. How much does a SF book advertised in this CCI cost?
15. Who is a software company looking for programmers?
16. On which date does the Data Protection Act become effective?
17. Who was the main author in the CCI Books Offer?
18. How to stop a moving car in "Chicago"?
19. What colour is the logo on CCI covers?
20. How much does(do?) Blazing Paddles cost?

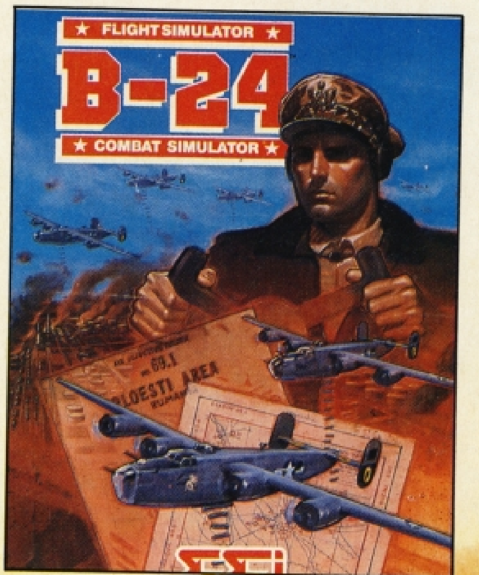
There simple, isn't it? Hardly raise a sweat, will you, getting those answers? Take you about thirty seconds, I'd say. Well, couple of minutes then. Another minute, say, and you can get your answers on a postcard — somebody wrote the Bible on the back of postage stamp, you know . . . Give it a try and that exciting Amiga 500 can nestle in your very own arms and we'll maybe give you a couple of Amiga products to go with it — if your handwriting is very easy to read! Postcards to January Amiga Competition, CCI, 40 Bowling Green Lane, London EC1 0NE to reach us by February 31st — sorry 28th 1988.

SEVEN NEW MIND BLOWING SIMULATIONS FROM

SSI

STRATEGIC SIMULATIONS INC

From the world's greatest creator of simulation software comes a further collection of outstanding challenges. Relive some of the momentous struggles that have changed the course of man's history; escape to worlds of fantasy and mystery where lies the unknown or create your own encounters played out in time and place of your own choosing. These are the challenges in which you take complete control.



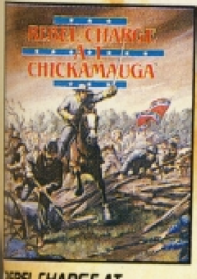
B – 24

From the war torn skies of World War II emerged one legendary offensive weapon – the B – 24 bomber. This superb simulation allows you to recreate the exploits of this great aeroplane on single mission runs or a 19 mission campaign to destroy oil refineries in Ploetsi, Rumania.

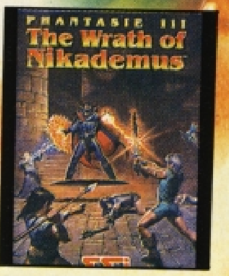
As pilot you control the mission flight on a bombing raid from your home base in Italy; as group leader you command 40 B – 24's on bomb runs to 14 targets deciding on when and where to bomb depending upon weather, plan availability, group efficiency and target oil production levels. A flight and combat simulation of unparalleled quality.

CBM 64/128 Cassette **£14.99**
Disk **£19.99**

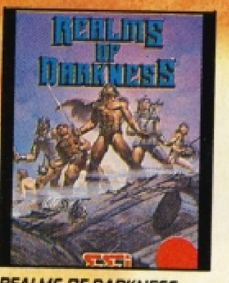
B – 24
"The most realistic flight simulation you're ever likely to experience"



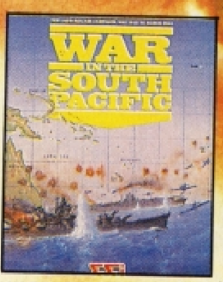
REBEL CHARGE AT CHICKAMAUGA
The definitive simulation of the South's last major offensive thrust – the Battle of Chickamauga. This game faithfully recreates the two-day battle to give you the opportunity [illegible] and repeat or reverse history.
APPLE, ATARI, CBM 64 £24.99 Disk £29.99 IBM



PHANTASIE III – THE WRATH OF NIKADEMUS
Promises a spell-binding story-line with enough twists and turns to satisfy your wildest fantasies. This time the Dark Lord Nikademus has set his evil sights on conquering not only an island, but the entire world.
ATARI, AMIGA £24.99



REALMS OF DARKNESS
Fame, fortune and power. These are the spoils of victory for those who survive this incredibly challenging and multi-faceted fantasy adventure game.
CBM 64/128 £19.99



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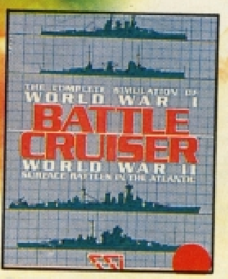

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SURVIVORS

The Survivors by Atlantis

The year is 2087 and the world has been devastated by a nuclear war. Your mssion is to rescue almost a 1000 survivors from a damaged hibernation dome, (Don't ask me what humans are doing. hibernating!). You have 3 droids to help you rescue and teleport your survivors to safety.

Droid number one is adapt at tunneling through passage ways etc. Number two is a caring soul, and teleports the humans you find, to safety. Droid number three is all brawn, and gets the other two out of difficulties when they get trapped behind rocks or when the humans are hard to get at. His job is to push rocks, and his help is called on a lot.

Any move on your part could cause a rockfall whic could i.e. paralise your whole mission. Worse still if you get hit by a rock you lose precious power. There are also other droids which were once Guardians of the dome, but they have been damaged by fall-out, and now are hostile — you can crush or trap them with a boulder.

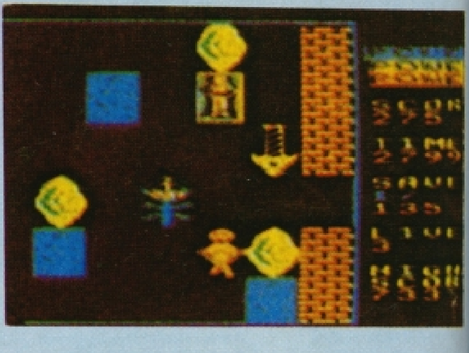
This game is very reminiscent of Boulderdash or Rockman, with just a little speed taken away from it, and a strategy element added. Every more has to be carefully planned in advance and even when you use your droids abilities well, and make good moves — you can be wiped out by those pesty hostile droids.

The graphics are rough-looking and have plenty of blocky edges, but for all this are quite attractive. There is hardly any sound to speak of.

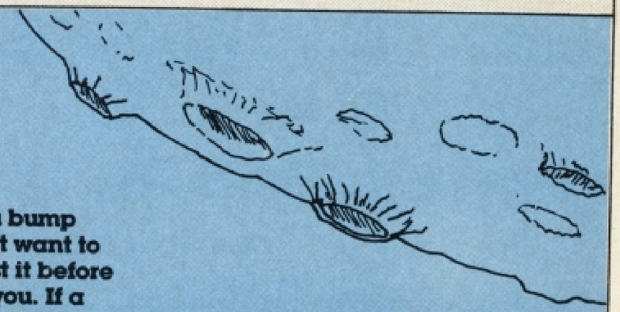
Overall, I found this a surprisingly good game, that at budget price could really make it a winner from Atlantis. It's a really original game that has a lot of depth, the one gripe, is that every time you die, everything you've done up to that point is reset to zero (except your score), and you must start all over again. It'll be quite a while before you finish this one.

C.K.

Graphics: 50%
Sound: 0%
Playability: 65%
Rating: CRISP



MEGA



Aliens by Electric Dreams

Your mission, is to retain control of base by any means, trying to keep your crew members alive in the process.

The crew have set up a Mobile Tactical Operations Bay (MTOB) just outside the colony base, and this is the position from which you command the four members of team.

As you move around you bump into aliens and if you don't want to get killed you have to blast it before it turns and advances on you. If a member of the crew is attacked, and you're controlling someone else, a bleeping sound is activated, and you must either switch tothat player very quickly, or send another person to help him/her, which entaisl frantically running from room to room.

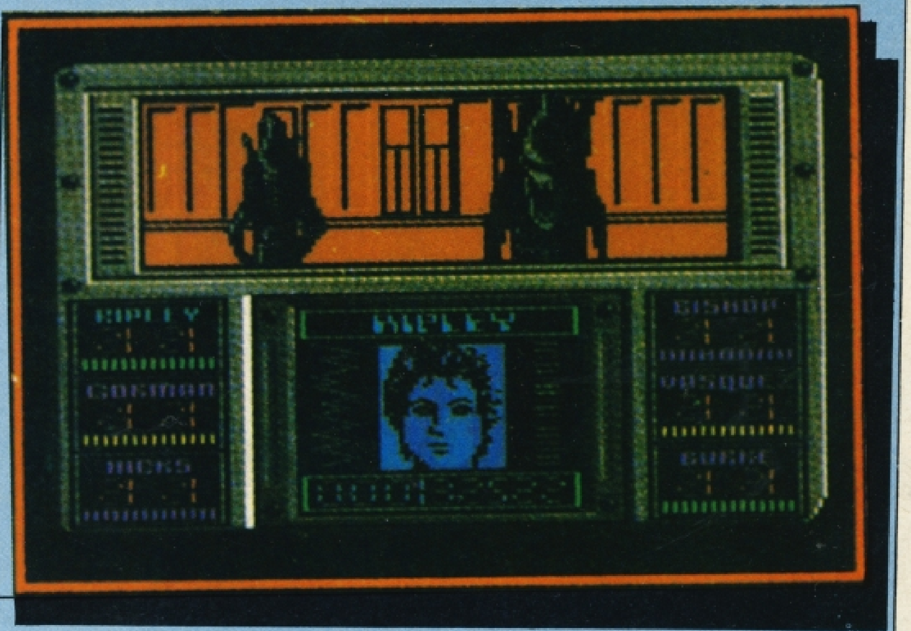
This game is very atmospheric with graphics that suit the game perfectly, sound is lacking, but this does detract from the game at all. At excellent release, from Electric Dreams, who, I don't think have released a C16 game before. Well done.

ALIENS™

With this squad you enter the colony base at room 1 and you lead them to the Queens Chamber where you can have a crack at taking out the leader, and mother of all the aliens. Each crew member has a video screen attached, through which you view their surroundings. In the centre of the viewer, is a gun sight which moves you around your present location, and shoots any alien that gets into your sights.

Your energy-in the form of a green bar — gets smaller as your stamina decreases and turns yellow when you are captured by the aliens, and red when you are impregnated by them and have no chance of recovering, or getting rescued. Your stamina can be increased if you rest.

You direct crew members around the base by indicating the number of moves to make, and then, the direction. The crew member will then move to that destination, unless he runs out of energy, or reaches a locked door.



Bio-Mechanical growth, is a big problem in the base, and if you let it spread, it could block up the armoury weapons, and block up the generating room, putting you in darkness, and greater danger.

Graphics: 75%
Sound: 15%
Playability: 76%
Rating: MEGA

AMIGA

ANCO

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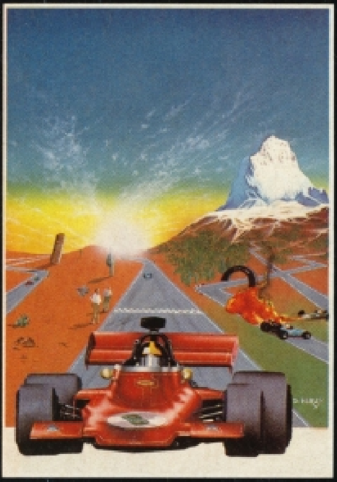

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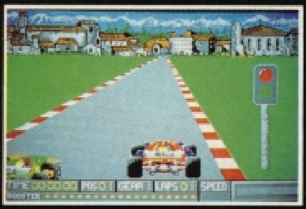
TIME
POS
GEAR
LAPS
SPEED
BOOSTER

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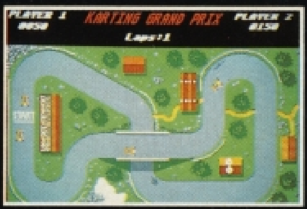
PLAYER 1
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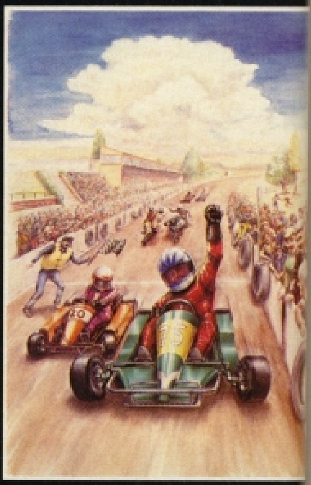
KARTING GRAND PRIX
PLAYER 2
0150
Laps:1



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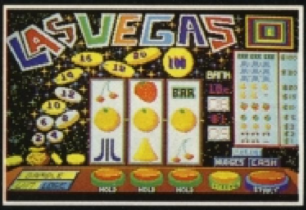
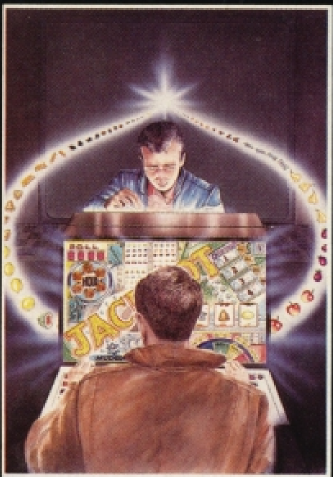
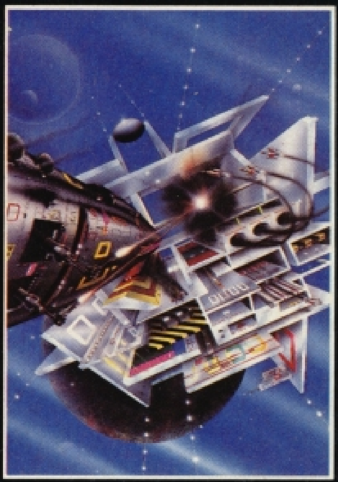

LAS VEGAS
BAR
BANK
CASH
HOLD





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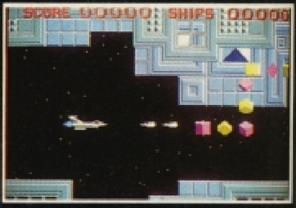
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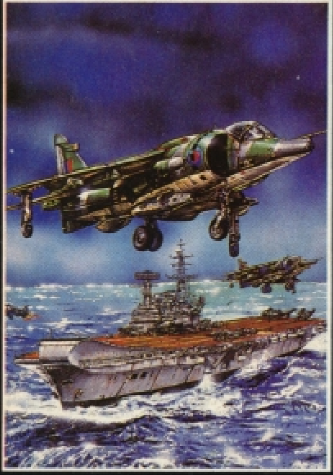
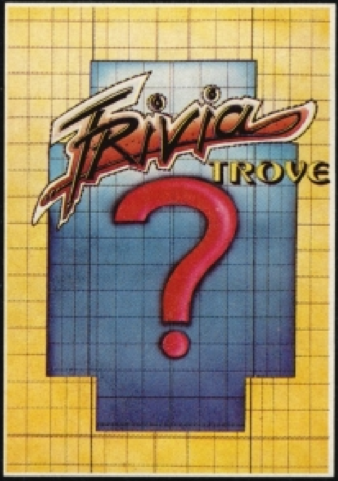
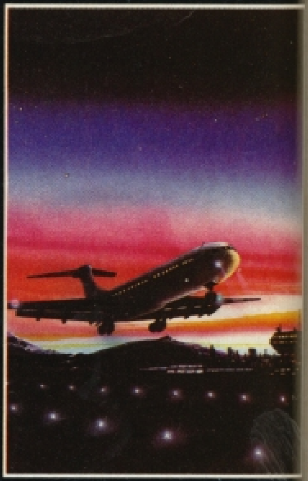


Strip
Poker II


Trivia
TROVE
?



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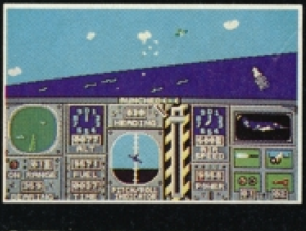
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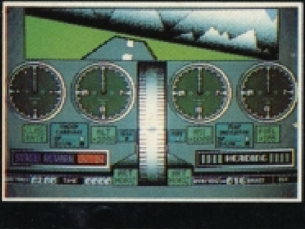

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COMMENT

Welcome to another chapter from Middle Earth, come Pick up a chair and sit with me while we discuss the news from the world of Adventure. Some interesting items on the agenda this month, not least the review of FADE OUT which was unfortunately left out last month because of restrictions of space. There also is NORD AND BERT and PLUNDERED HEARTS from the Infocom stable and YES PRIME MINISTER by Mosaic. I was hoping to bring you a couple of new SSI role players, but got so caught up in the Infocom work there just was not enough time to devote to them, but I shall make amends next month. Also there is the second map from the ZORK series along with a mighty slice of tips to go, with it.

First though I would like to talk about adventure endings. I don't know about you, but after toiling away for days, sometimes weeks in order to solve a tricky adventure there is nothing more disappointing than seeing "you drop the missing talisman into the well of knowledge thus saving the people of Samna from extinction. Well done you have won. Would you like to try again?". Now there is nothing more annoying than something like this, and it happens all the time in various forms.

Personally, I get a great feeling of accomplishment on completing an adventure, and I think that to Prolong the excitement at the end is crucial. Why should the thing stop just after the final puzzle? Why not let the hero carry on and wander around some new locations enjoying the Praise of some other characters in the story, or just return home and ponder on the mighty deeds that have taken place? So much has been said and written about a little word called atmosphere, and to chuck it all away after many hours of build up is criminal. So come on Level Nine and Magnetic Scrolls, whom I know read this section each month, how about some decent endings eh?

MAILBAG

Dear Andy,
Help! Please take pity on an aging (30?) female, who started out on computers late in life. My real passion is for good basic adventures, but I always get stuck at some point. In Shadows of Mordor how do you move the raft, I presum you use the pole, but what do you use as a Pole? Please help me kind sir, I think your pages are great by the way.
Mandy Flower, Bath

You are barking up the wrong tree there, Mandy, as the raft can only be moved from the northern edge of the swamp, so make it there and then climb on to it and type PULL RAFT and your troubles will be over. Write in again and let me know how you get on. Thanks for the Praise, it's always nice to feel appreciated!

Dear Andy,
I am playing Infocoms STARCROSS. How do I get the rod from the nest in the cage? What do I do with the rods, what do I do with the Projector, and how do I reach the hatch in the dome, and are the animals on the grassland significant?
Neil Thomas, Notts

OK Neil in order of Problem, Throw something to get the rod down, put the rods in the slots which correspond to the colour, do nothing with the Projector or animals, and play with the rods to reach the hatch.
Good luck

Dear Andy,
Hi, first of all thanks to Level 9 for their great adventure RED MOON, it is the best adventure I have ever played. I looked forward to PRICE OF MAGIK but was very disappointed. I mapped nearly the whole adventure without doing anything else than N,E,W etc. How? There was a problem with genlock and it gave me 250 life points. Come on Mr Austin, better please. Do you know if LORDS OF MIDNIGHT or DOOMDARKS REVENGE will come out on Amiga as I have now upgraded to the 500, and when will EYE OF THE MOON come out?
Rune Steffensen, Norway

Price of Magik was actually quite a good game, yes, there were a few bad points, Rune, like reducing your magic points every time you saved a game, but all in all I enjoyed it. You can't blame Pete Austin for a GEMLOK fault can you? On to your request about Mike Singleton's Trilogy at present there are no plans for an Amiga conversion, and as for EYE, well as Mike has been hard at work coding STAR TREK for the last 200 years, I doubt if he has had time, but I will see if I can bend his ear for you.

Adventure

Adventure

HELP AND HINTS DEPT

Dear Andy,
Helppp!!! On Gremlins, how do you explode the gas and where do you get the metal plate from. I have been trying to solve this puzzle for over a year.
D. A. Ellison, Wetherby

For over a year and it took you this long to write to me? Tut Tut, still it shows you have a lot of patience. You do not explode the gas, just get the spark igniter from the kitchen drawer and go to the mailbox with the welding torch. Examine the mailbox with the flashlight and then "weld" or "cut" mailbox for your metal plate.

Dear Andy,
After reading your section in November's CCI I saw your request for top tens. This is my top twenty; Alternate Reality (Dungeon), Starflight, Bards Tale, Might and Magic, Sundog, Ultima II, Destiny Knight, Enchanter, Universe and Suspended, Alternate Reality (City), Planetfall, Ultima IV, Eternal Dagger, Legacy of the Ancients, Ultima III, Univers II, Alien Fires, Phantasie, Shard of Spring, Rings of Zilfin.
Rezas Clyro, Surrey

Thanks for your list Rezas, and thank you for your map of Alternates Dungeon, which I will put in the Section after the Zork maps have appeared. If there is one comment to be made on your selection it is the insertion of Alien Fires, which I found to be quite poor indeed considering it was written for the mighty Amiga.

ZORK II — The Way Through

You need to discover and master the source of the Wizards powers in order to complete the game. Until you do, he will create a lot of mischief for you.
Stuck for an answer to the riddle?
Type:- Answer "a well". From the bottom it looks tall doesn't it?

Can't stop the carousel?
You need to find the Machine room and play with some buttons.

What is the clay brick for?
It is a plastic explosive that by inserting the black string provides a fuse. Insert it in the rusty box.

Can't open the door to the tiny room?
Use the old trick of pushing the key out of the hole with the letter opener and catching it on the mat and then pull it through.

The ice room problem
Annoy the dragon and he follows you, so get him into the ice room.

The Lizard doorkeeper
The key is around the Unicorn, but you also need to give him the candied insects from the bottom of the pool.

The Oddly Angled Room
Walk in the directions of a baseball diamond, starting from home plate (the batter) SE, NE, NW, SW.

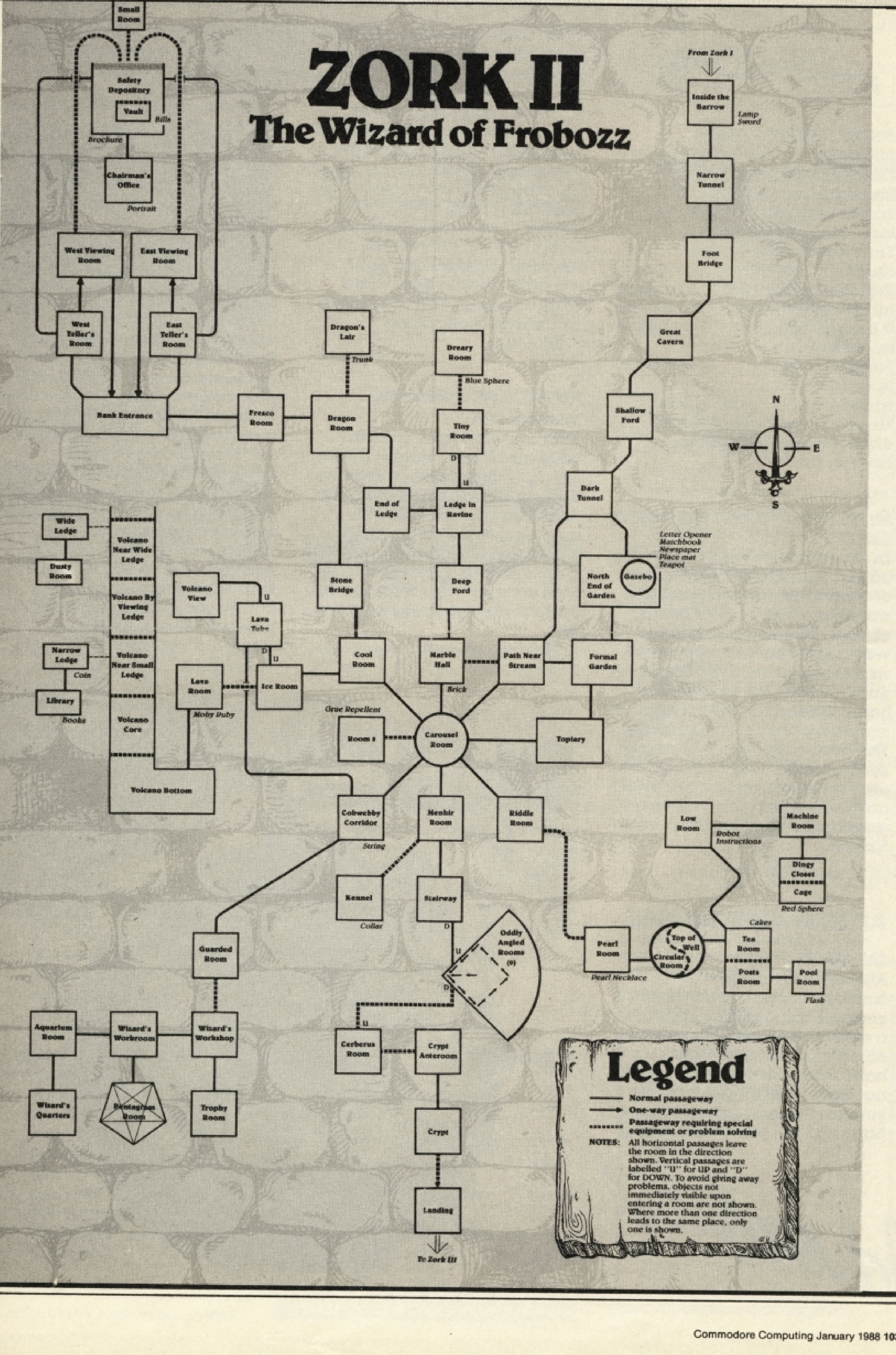
The Vault
Enter the Depository from the north and you will be transported to it. The north wall is the exit.

The Balloon
This is the basket and canvas, and you use it by burning the newspaper in the receptacle.

The Well
Get in the bucket and pour water into it.

The Wizards Workshop
Place the black sphere into the pentagram. This will summon the demon. Give him all the treasures, which will satisfy him and then ask him for the Wizards wand. Or, you can ask him to kill the Wizard!

Just for Fun
Try telling the Robot to get wand in the Wizards presence, kissing the Wizard, making a wish at the well, or eating the Zorkmid bills.


ZORK II
The Wizard of Frobozz
From Zork I
Inside the Barrow
Lamp
Sword
Narrow Tunnel
Foot Bridge
Great Cavern
Shallow Ford
Dark Tunnel
N
W
E
S
Small Room
Safety Depository
Vault
Bills
Brochure
Chairman's Office
Portrait
West Viewing Room
East Viewing Room
West Teller's Room
East Teller's Room
Bank Entrance
Fresco Room
Dragon's Lair
Trunk
Dragon Room
Dreary Room
Blue Sphere
Tiny Room
D
U
End of Ledge
Ledge in Ravine
Letter Opener
Matchbook
Newspaper
Place mat
Teapot
North End of Garden
Gazebo
Wide Ledge
Dusty Room
Volcano Near Wide Ledge
Volcano By Viewing Ledge
Volcano Near Small Ledge
Volcano Core
Volcano Bottom
Narrow Ledge
Coin
Library
Books
Volcano View
U
Lava Tube
D
U
Lava Room
Moby Ruby
Ice Room
Stone Bridge
Cool Room
Deep Ford
Marble Hall
Brick
Path Near Stream
Formal Garden
Grue Repellent
Room 8
Carousel Room
Topiary
Cobwebby Corridor
String
Menhir Room
Riddle Room
Low Room
Robot Instructions
Machine Room
Dingy Closet
Cage
Red Sphere
Kennel
Collar
Stairway
D
Oddly Angled Rooms (9)
U
D
Guarded Room
Pearl Room
Pearl Necklace
Top of Well
Circular Room
Cakes
Tea Room
Posts Room
Pool Room
Flask
Aquarium Room
Wizard's Workroom
Wizard's Workshop
U
Cerberus Room
Crypt Anteroom
Wizard's Quarters
Pentagram Room
Trophy Room
Crypt
Landing
To Zork III
Legend
Normal passageway
One-way passageway
Passageway requiring special equipment or problem solving
NOTES: All horizontal passages leave the room in the direction shown. Vertical passages are labelled "U" for UP and "D" for DOWN. To avoid giving away problems, objects not immediately visible upon entering a room are not shown. Where more than one direction leads to the same place, only one is shown.

ADVENTURE NEWS

JINXTER NEXT SCROLLS RELEASE

The next release from Anita Sinclairs crew at Magnetic Scrolls is another sorties into the land of Aquitania called Jinxter. The story is about a lost magic charm bracelet which ensured that the people would always be lucky and healthy. Naturally as it has got lost (into seven bits I might add) bad luck and Pestilence is bound to strike. It is up to you and a cockney friend to save the situation. More news shortly. PS what about Under Westminster Bridge, Anita?

MIRRORSOFT TO RELEASE DARK CASTLE

In America there is a company called Three Sixty Pacific, who are marketing a huge graphic adventure that has achieved almost cult status over there. What about us I hear you cry, well the cavalry in the shape of good ol' Pat (Mirrorsoft) Bitton has acquired the British rights to and will be releasing it shortly. The game contains 14 danger zones comprising of dungeons and caves etc and armed with only a handful of rocks you're quest is to vanquish the Black Knight.

ADVENTURE REVIEWS

FADEOUT

Angus Manwaring — Quill

Another CCI entrant in the do it yourself competition. Fadeout is a quilled adventure that starts off with you on a cliff face holding on for dear life! You do not know anything about why you are there, in fact when you have worked out what is going on and why you have solved the game. Angus has used especially at the beginning few scenes, some very descriptive narrative that really evokes some atmosphere. Unfortunately this tapers out into just a few lines as you progress, something that, memory permitting Angus you could expand. Some clever puzzles though and could well be of commercial standard after a few adjustments. Well done. Write to Angus at 45 Green Way, Tunbridge Wells, Kent.

7 out of 10.

PLUNDERED HEARTS

Infocom £24

Infocoms first foray into the Mills and Boon romatic stories which, incidentally, is their first adventure written by a woman, Amy Briggs, a 25 year old graduate from Minnesota. Plundered Hearts is all about swashbuckling Pirates on the high seas, mutiny, kidnapping and romance in any order you like.

Playing the part of a female heroine shouldn't deter you (if you are of the male persuasion) as the puzzles and adventures are exciting and original in their own merit.

Amy's style is very descriptive, although the beginning is more scene setting than interactive, so saving is recomended otherwise a rather lengthy intro will have to be endured over again.

This apart, when the adventure really gets going, you are faced with some early chances for a quick demise, in the guise of a lighted fuse leading to a pile of gunpowder that cannot be reached and a mutinous crew of cut-throats that cannot be calmed. Very taxing. To solve Plundered Hearts you must use every once of female intuition and not a small amount of female clothing.

One thing that pleases me is that with the virtual plethora of Infocom products that are coming out at a rate of knots this year, the standard is still tip top which proves that in the hands of professionals a lot of product does not mean a diluted product.

9 out of 10.

Plundered Hearts
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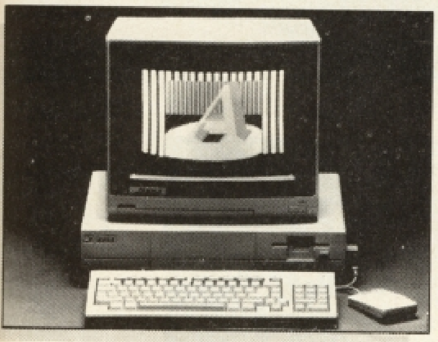

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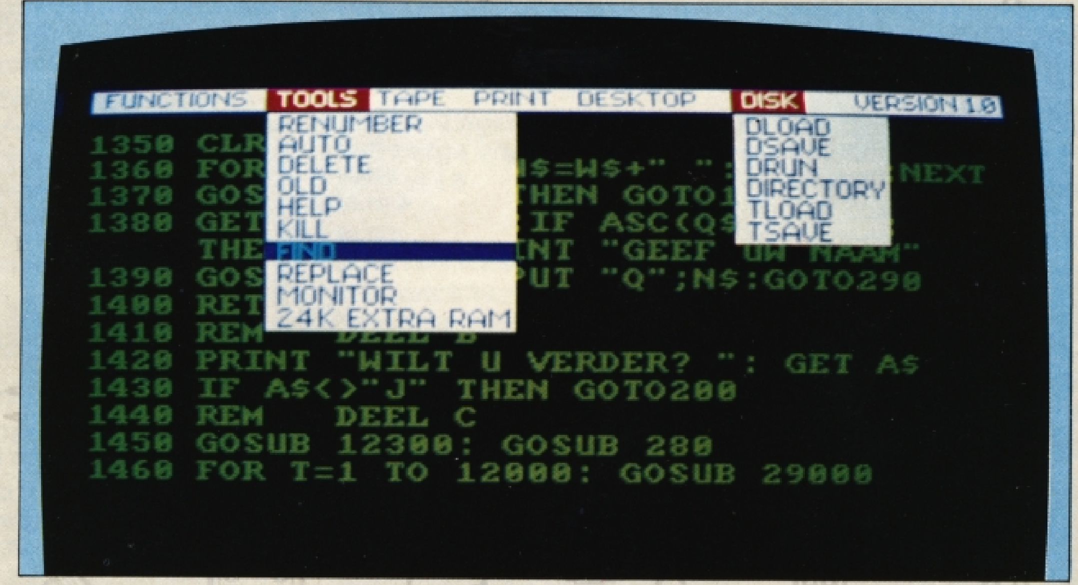

```
1350 CLR
1360 FOR            N$=W$+" ":      NEXT
1370 GOS            THEN GOTO1
1380 GET            IF ASC(Q$
     THE            INT "GEEF UW NAAM"
1390 GOS            PUT "Q";N$:GOTO290
1400 RET
1410 REM     DEEL B
1420 PRINT "WILT U VERDER? ": GET A$
1430 IF A$<>"J" THEN GOTO200
1440 REM    DEEL C
1450 GOSUB 12300: GOSUB 280
1460 FOR T=1 TO 12000: GOSUB 29000
```

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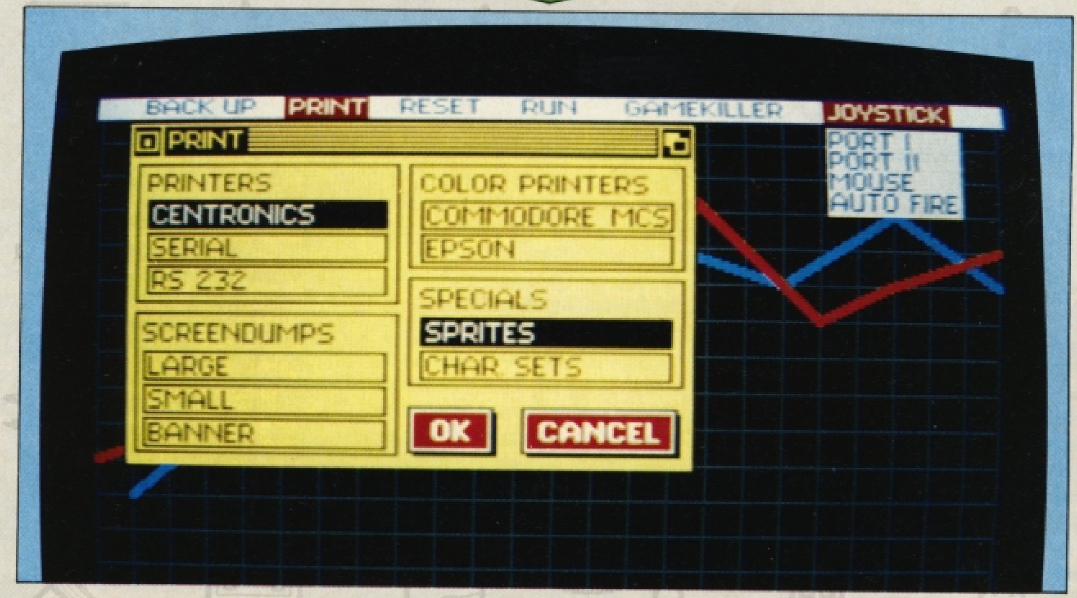

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PRINT
RESET
RUN
GAMEKILLER
JOYSTICK
PORT I
PORT II
MOUSE
AUTO FIRE
PRINT
PRINTERS
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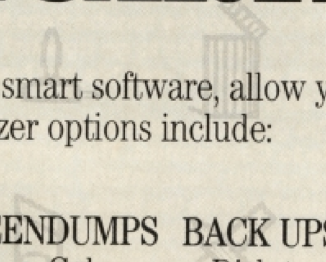


LIVE AMMO

Ocean

This, the first of two Christmas compilations from Ocean is made up of The Great Escape, Top Gun, Green Beret, Rambo and Army Moves.

The Great Escape was released about six months ago. After the long advertising campaign, and a lot of expectation, I was disappointed when it finally appeared. The game is set in a Germany POW camp in the Second World War, the object being to escape.

The play area is a window in the centre of the screen, with the camp drawn in 3D, white in black for most of the game. When outside, the play area scrolls very jerkily which is one of its largest downfalls. On entering a room, the screen display changes to a flip-screen format. Around the camp you can find tools and objects to help your escape, which you use and how you use them is up to you, as there is more than one escape route.

An almost total lack of sound, bad scrolling, and a rather uneventful game make The Great Escape a game that should have been a lot better, and one that falls down more on programming that design.

Top Gun is the game of the hit film. The object is simple, and involves shooting down an F-14 fighter which can be controlled by either the computer or another player. The screen is split vertically to show the view from each players' cockpit. When the opposing plane isn't in view, the only thing you see is a horizon. The enemy plane is drawn in vector graphics, but moves jerkily. The game isn't that disimilar to Ace 2, but partly because of its boring graphics and sound, it isn't as fun to play.

Green Beret is a conversion from the Konami coin-op. Taking control of The Green Beret, it's up to you to rescue the captives. There are four levels of enemy defence to get through before you achieve your goal.

The screen scrolls from right to left taking you through the missile base, harbour, bridge and prison camp. You start armed with a knife for stabbing nasty soldiers, and can obtain more powerful weapons by killing the commandant.

Green Beret is very hard, but can be a lot of fun when you get the hang of it. Its graphics are nothing special, but the sound effects and music from Martin Galway are well above average. An enjoyable game which will be appreciated most by fans of the arcade version.

It's pretty obvious what sort of a game Rambo is. Believe it or not, it does have a plot. You are John Rambo, skilled jungle soldier, and have been assigned the job of seeking out a POW camp where innocent Americans are being held. You must then take pictures as evidence and return to base. Rambo being the macho hero that he is, he decides to go against orders when he sees his old buddy tied to a cross.

The game is played in a similar style to Commando. The playing area scrolls horizontally as well as vertically, with the bulk of the area being north of the start point. Collecting rocket launchers, machine guns, explosive arrows and grenades. After rescuing your buddy, it's off to find the helicopter, in which you hope to rescue the remaining captives and fly them to safety.

There's not much to Rambo (although I'm not saying it's easy), but it has some excellent music and sound effects to suit the explosions and destruction. Not a long-laster, but will provide some good satisfying entertainment.

The last on the compilation, Army Moves, was the first from Dynamic, the team that brought us Game Over and recently Freddy Hardest. You are a member of a special group of crack commandos. Your orders are to infiltrate the enemy base and steal information.

Seven stages make up the game. The first is a Moon Patrol style jeep game involving jumping gaps in the bridge and shooting oncoming vehicles and helicopters. Reach the chopper base and it's up and away for the next three levels as you fly an enemy helicopter over desert, sea and jungle.

Abandoning your chopper you go it on foot through the swamps. The quicksand is trouble enough, with the added dangers of enemy guerillas and low-flying toucans.

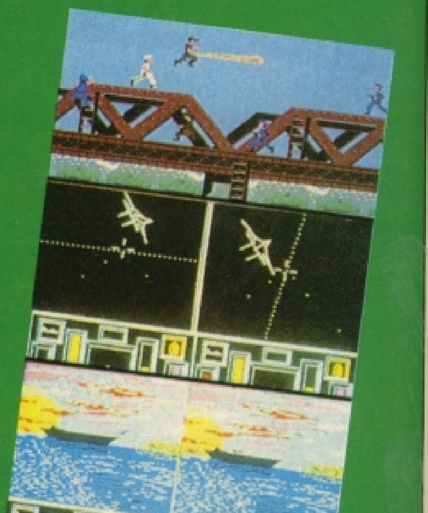
Once you've found the barracks, you must cross the heavily guarded area between them and the main building. Once in the building you must find the bunker with the safe containing the info.

Graphics and sound are above average, and the game is good fun, but can be frustrating.

Live Ammo has its ups and downs, but it certainly comes out more up than down. It gives good value for money assuming you don't have these already, but as with most compilations, it will be of most interest to new 64 owners.

T.H.

Price: £9.95 cass £14.95 disk



PASSENGERS ON THE WIND 2

Infogrammes — £9.99

I didn't like Passenger 1 one little bit. I found it slow, fussy and boring. It may well have been an award winning and highly acclaimed novel, but the computer version certainly wasn't.

For me, Passengers 2 just prolongs the agony and although the screen handling has been cleaned up, the music is awaful, the graphics o.k'ish, but as an adventure it is about as entertaining as a toothache. 2 out of 10.

NORD & BERT COULDN'T MAKE HEAD OF TAIL OF IT

Infoccom — £24

For those of you who enjoy Infocom's fantasy based thrillers, or good stories with bags of atmosphere will be better off giving this game a miss, but if you enjoy some very light-hearted entertainment, with some brain teasing 'play on words' puzzles then Nord and Bert is an essential purchase.

It comprises eight short stories that contain a multitude of spoonerisms, puns, wordplay and other verbal trickeries, all involving the town of Punster. In fact, you can only play the eighth story once you have solved the other seven, so, there is an end in sight at all times. You get one password each time you complete a scenario (in any order) then enter all seven passwords to get into the final tale.

Nord and Bert is also the first Infocom release that requires no mapping or compass directions, as at the top of the screen is a status line which tells you what places you can visit next, so, just typing Freezer or Barn etc., will do. Also, all hints are built in, so if you are stuck just type Hint and a menu of hints will appear — just take your pick and all's well that ends well.

My favourite tale is "Eat your words" which takes place in the Teapot Restaurant. There are 28 well known phrases used in only a 3 location game. "Vent Your Spleen, Bury the Hatchet, Take Advice with a Pinch of Salt and Take Umbridge" are all examples of the style of this story concerning poor waitress service in the restaurant. I loved it! More please Mr. Berez.
9 out of 10

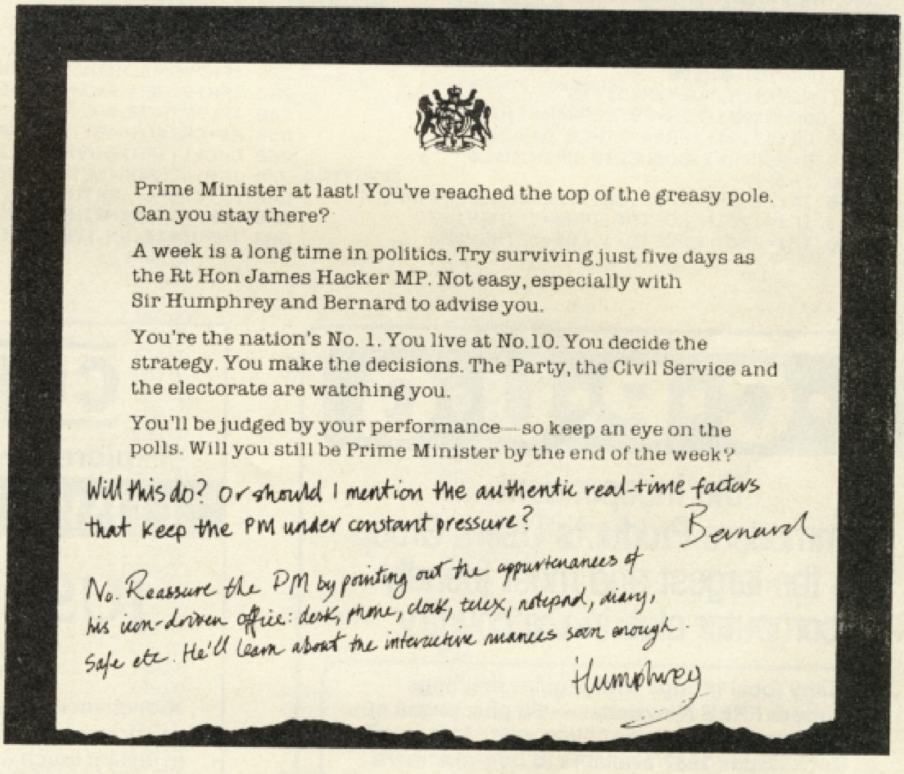
YES PRIME MINISTER

Mosaic — £14.95

On the other hand, this little number from the "Adrian Model" stable, is a very witty product. For those of you who enjoy the T.V ramblings of Jim Hacker, the prodding of Bernard Woolley, or the pontificating verbal diarrohea of Sir Humphrey, this game has them all in abundance.

Yes, there are drawbacks, the memory limitations which restrict the options available to you and the fact that it can be a relatively short game, but in terms of pure entertainment, the scripts are very funny indeed. Most of the action takes place in the P.M.'s office, which is graphically represented and you move a cursor over various objects to use such things as phone, telex, safe, desk-diary etc. The verbal interaction takes place at the meetings you attend and you get to decide on both parties views so a lively debate can ensue. The idea is to last for 5 days as P.M., which is not difficult but taken in the lighthearted vein to which it is aimed, the game is fun.

My only moan is the price, a bit steep for the package £8.95 would have been better.
7 out of 10.



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Will this do? Or should I mention the authentic real-time factors that keep the PM under constant pressure? Bernard

No. Reassure the PM by pointing out the appurtenances of his icon-driven office: desk, phone, clock, telex, notepad, diary, safe etc. He'll learn about the interactive nuances soon enough. Humphrey

That is it for this month.

Have a good Christmas and keep those letters coming. Next ish I'll have some new Role Players from SSI under the Moss Cosh, so until then, keep up the good work and solve as many adventures as you can.

Adventure

ICPUG.

This is a very useful public domain program written a long time ago but which is still valid today.

It will read in the data contained on any track and sector on any Commodore disk drive including; 2040, 3040, 4040, 8050, and 8250. Once read in, each block of data is translated into ASCII and displayed on the screen.

Lines 80-190 Read in the data from disk.
Line 210-290 Translates the data and displays it.
All non printable characters are shown as ".''s.

```
10 OPEN15,8,15:PRINT#15,"U:"
20 X=2
30 INPUT"]TRACK,SECTOR";T,S
40 INPUT"█DRIVE NO:";D$
50 PRINT#15,"I"+D$:D=VAL(D$)
60 OPEN3,8,X,"#"
70 IFX=15THEN190
80 PRINT#15,"U1";X;D;T;S
90 GOSUB300:IFEN=70THENX=X+1:GOTO70
100 GET#3,A$:IFA$=""THEN A$=CHR$(0)
110 A=ASC(A$):GOSUB210:PRINTH$L$" ";
120 I=I+1
130 IFI/8=INT(I/8+.001)THENGOSUB290:PRINT
140 IFI=128THENGETB$:IFB$=""THEN140
150 IFI=256THENGETB$:IFB$=""THEN150
160 IFI=256THEN190
170 IFI=128THENPRINT"]"
180 GOTO100
190 CLOSE3:CLOSE15
200 END
210 GOSUB260:H=INT(A/16+.001):L=INT(A-16*H+.001)
220 IFH>9ANDL>9THENH$=CHR$(H+55):L$=CHR$(L+55):RETURN
230 IFH>9THENH$=CHR$(H+55):L$=CHR$(L+48):RETURN
240 IFL>9THENL$=CHR$(L+55):H$=CHR$(H+48):RETURN
250 H$=CHR$(H+48):L$=CHR$(L+48):RETURN
260 C=C+1:IFA>64ANDA<91THENA$(C)=CHR$(A):RETURN
270 IFA>47ANDA<58THENA$(C)=CHR$(A):RETURN
280 A$(C)=".":RETURN
290 FORK=1TO8:PRINTA$(K);:NEXT:C=0:RETURN
300 INPUT#15,EN,EM$,ET,ES:RETURN
```

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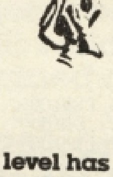
C64

CRISP



Jet Boys — CRL

CRL have never been a software house from whom you'd expect much action, Tau Ceti being their only highly popular games that springs to mind. It therefore came as something of a surprise to find that Jet Boys is a very professional looking product.

The game is far from original, but what decent game is these days? It's a horizontally scrolling shoot 'em up for one or two players in a style similar to the coin-op Side Arms.

Whether you choose to play simultaneously with another player, or on your own, the idea is the same; to reach the end of each of the four levels. Each level has a two speed scrolling background, the theme of which changes with the levels. The players each control a man with a jet pack and a simple gun. You know the score, waves of aliens fly onto the screen, do their fancy bits, spin round, and fly off again. That is, unless you shoot them first.

Along the bottom of the screen are little blobby bubbles that are deadly. These are a good idea, but they do limit the number of aliens in each attack wave to four.

At the end of each level, you encounter a large alien which requires a load of laser fire in a very short time limit to kill it.

Of course, there's the progressive weaponary. The first up-grade seems to do no more than emit a different sound effect, but the quad laser, shield, and speed up, all give the game a noticable boost.

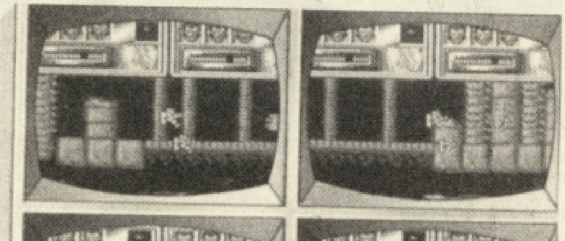
The gameplay of Jet Boys is very similar to Nemesis and Delta, but is still fun even though you may have done it all before.

The whole look and feel of the game is very slick. The sprites are attactive, if in an unoriginal style, and the backgrounds match the sprites with smooth scrolling.

Music and sound effects are very average. With a bit more action and some more levels, Jet Boys could be a very good game. As it is, it's an enjoyable game, with very pretty graphics indeed, but haven't we seen it all before?

T.H.

Graphics: 89%
Sound: 59%
Playability: 84%
Overall: 80%
Rating: CRISP
Price: £8.95



CBM SCREENSHOTS

In addition to Jet Boys

CRL have just announced the release of another four games. They are jumping into action! These are Ninja Hamster: progress from namester to ninja by duffing up animals, Lifeforce: stabilize a power station that's developed a life of its own, Vengeance: put a stop to a nasty alien race, and Alien: fight your way through nasty humans to get to your escape route, the shuttle.

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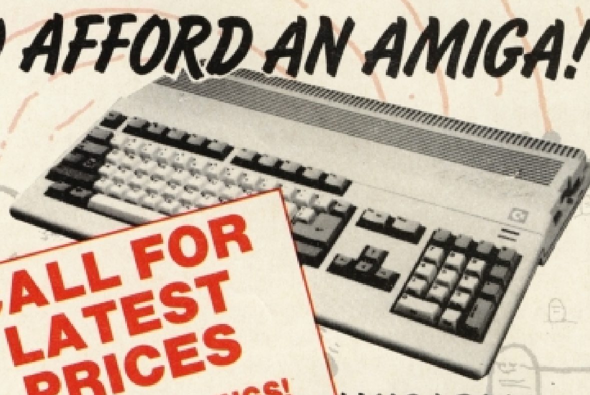

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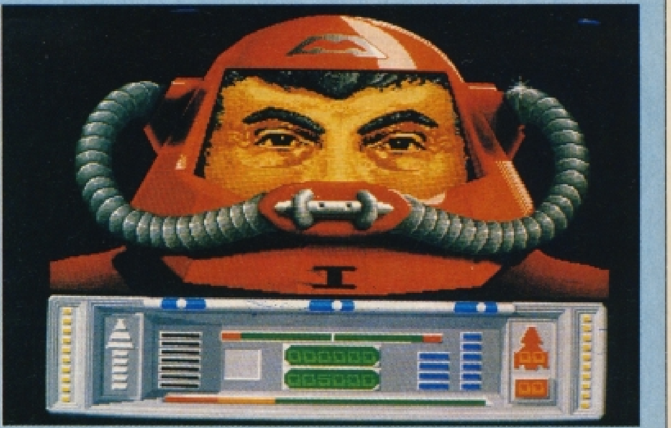
INSANITY FIGHT

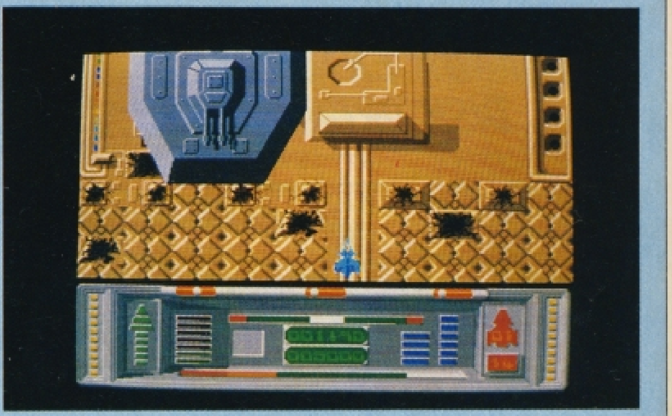
Microdeal

What sort of game does the name Insanity Fight suggest to you? Mad, mindless shooting and destruction? If so, you'd be right. This won't be the first scrolling zapper any gamer has played, but it could well be the best for a long time.

The instructions are short and to the point, although they don't actually say how a level is cleared. Impressive titles are displayed over a six-plane parallex starfield, and give the player the choice of English or German text.

A couple more title sequences later, the game gets underway. I was pleasantly surprised to see a layout a little different from most vertical scrollers. Instead of a score panel on one side, with a small play area on the other, Insanity Fight has a full-screen PAL display, with an American version also available. The game is played over Boldrunner/Uridium style backgrounds with panels, and implacements drawn in bas-relief. Your ship is constantly under attack from aliens which snake around the screen very smoothly.





Aliens and various structures on the background can be shot for points, but some parts of the background must be avoided, which can be very tricky at high speeds. The basic look of the backgrounds is not that colourful, but in parts, some brilliant colour cycling livens it up very well.

Every now and again, a massive spaceship about half a screen wide and a few high, comes down the screen with its cannons blasting. It's safer to dodge it, but shooting it results in a satisfying enormous explosion.

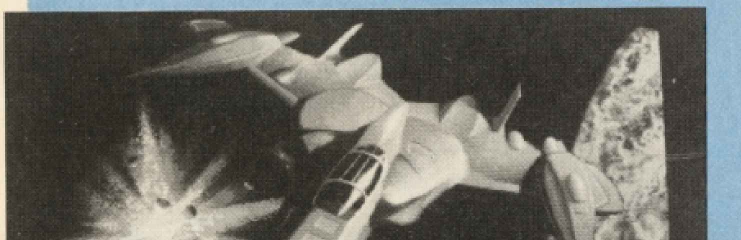
Graphics, both sprites and backgrounds are extremely well drawn, with smooth movement all round. Some strange sounding speech and music are joined by atmospheric sound effects.

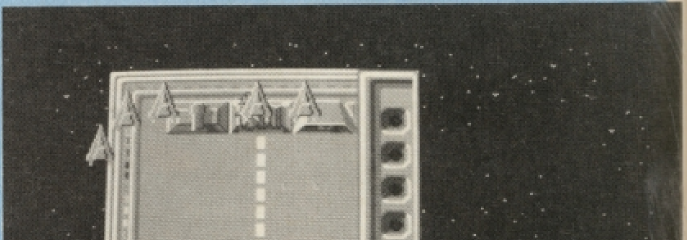
Insanity Fight was written by the Swiss Linel Team and as they state, the game makes good use of the Amiga's hardware, and hasn't been ported across from the ST.

This has to be the best shoot 'em up around for the Amiga, and although it breaks no new ground in game design, it will be greatly enjoyed by Amiga users in need of a good bit of action. Highly Recommended.

Price: £24.95

T.H.





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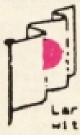

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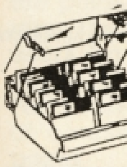

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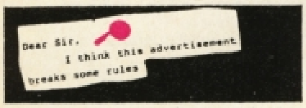

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HORGAN'S HINTS

HORGAN'S HINTS
Although new software for the C16 is getting very thin on the ground, it seems interest in the machine is still high. We've had a lot of requests for C16 pokes and are pleased to be able to meet the demand. Amiga users haven't been forgotten with some tips for Faery Tale adventures, and, of course, there are C64 pokes.

(C64)

This first tip comes from Bevis McNeil of Leeds.

The Equilizer:
Hold down **RESTORE** and tap **C** repeatedly to jump from stage to stage.

The person who sent in the following pokes forgot to include name and address. Send us your address, Anon from Breda, and we'll send you a CCI T-shirt.

Frost Byte:
Here's one to warm the cockles of your joystick. Load, reset, type **POKE 4388, 165 (RETURN).** Then type **SYS 2825** to start the game with infinite lives.

Krakout:
Is kraking out proving to be a bit of a problem? Cruise on through with these two pokes. Load, reset, type **POKE 35220,200 (RETURN) SYS 16035 (RETURN)** for unlimited bats. Alternatively, load, reset and type **POKE 32934, (0-100)** to start on any of the 100 levels. **SYS 32837 (RETURN)** starts.

Olli & Lisa:
Stride forth and leap the platforms with infinite lives. Simply load, reset,. type **POKE 8513,0 (RETURN). SYS 7424 (RETURN)** starts the game.

For those of you without a reset facility, here are some no reset required listings from M. Pugh alias the Master Hacker. Save all listings for future use.

Quedex:

```
0 REM QUEDEX HACK (C)
THE MASTER HACKER
1 FOR x=528 TO 557
2 READ Y:POKE X, Y: C=C+Y:
NEXT
3 IF C=2895 THEN POKE 157,
128: SYS 528
4 PRINT "DATA ERROR"
5 DATA 169, 29, 141, 40, 3,
169, 2, 141, 41, 3
6 DATA 32, 86, 245, 169, 6,
141, 206, 1, 96, 72
7 DATA 77, 80, 169, 181, 141,
96, 46, 76, 235, 2
```

RUN the program, load the game with infinite units.

Solomon's Key:

```
0 REM SOLOMS KEY HACK
(C) THE MASTER HACKER
1 FOR X=384 TO 418
2 READ Y: POKE X, Y: C=C+Y:
NEXT
3 IF C=3063 THEN POKE 157,
128: SYS 408
4 PRINT "DATA ERROR"
5 DATA 169, 141, 141, 91, 1,
169, 1, 141, 92, 1
6 DATA 76, 21, 1, 169, 165,
141, 165, 8, 76, 15
7 DATA 8, 72, 77, 80, 32, 104,
225, 169, 128, 141
8 DATA 134, 9, 76, 16, 8
```

RUN the program, load the game with infinite lives.

Zynaps:

```
0 REM ZYNAPS HACK (C)
THE MASTER HACKER
1 FOR X=303 TO 319
2 READ Y:POKE X, Y: C=C+Y:
NEXT
3 IF C=1801 THEN POKE 157,
128: SYS 305
4 PRINT "DATA ERROR"
5 DATA 49, 1, 169, 189, 141, 2,
184, 108, 47, 0, 32, 86
6 DATA 245, 238, 211, 3, 96
```

RUN the program, load the game with infinite lives.

Livingston I Presume?:

```
0 REM LIP HACK (C) THE
MASTER HACKER
1 FOR X=330 TO 3322
2 READ Y:POKE X, Y: C=C+Y:
NEXT
3 FOR X=32 TO 327
4 READ Y:POKE X,Y:C=C+Y:
NEXT
5 IF C=2948 THEN POKE 157,
128: SYS 3301
6 PRINT "DATA ERROR"
7 DATA 169, 12, 141, 41, 3, 32,
86, 245, 169, 64
8 DATA 141, 189, 2, 169, 1,
141, 190, 2, 2, 96, 72
9 DATA 77, 80, 169, 173, 141,
134, 69, 76, 0, 64
```

RUN the program and load the game with infinite lives.

Anarchy:

```
0 REM ANARCHY HACK (C)
THE MASTER HACKER
1 FOR X=376 TO 393
2 READ Y:POKE X, Y:C=C+Y:
NEXT
3 IF C=1834 THEN POKE 157,
128;SYS 376
4 PRINT "DATA ERROR"
5 DATA 32, 86, 245, 169, 1,
141, 29, 4, 96, 72
6 DATA 77, 80, 206, 202, 32,
76, 162, 124
```

RUN the program and load the game with no sprite collision detection.

Max Torque:

```
0 REM MAX TORQUE HACKS
(C) THE MASTER HACKER
1 FOR X=312 TO 342
2 READ Y:POKE X, Y: C=C+Y:
NEXT
3 IF C=3749 THEN POKE 157,
128:SYS 312
4 PRINT "DATA ERROR"
5 DATA 32, 86, 245, 169, 121,
141, 218, 3, 169, 23
6 DATA 141, 219, 3, 169, 88,
141, 220, 3, 96, 72
7 DATA 77, 80, 169, 96, 141,
151, 102, 238, 32
```

RUN the program and load the game with infinite time.

Thanks go to Phillip Dutton of Sandwich in Kent for the following pokes.

Bombjack I:
Load, reset and type **POKE 5112-0 (RETURN)** followed by **SYS 3101 (RETURN)** and Jack may die as often as he likes. Won't that be fun?

Bombjack II:
Load, reset and type **POKE 7053,200 (RETURN)** with **SYS 39712** to start the game with 255 lives.

Ghosts 'n' Goblins:
Load, reset and type **POKE 2175,255 (RETURN) then type SYS 2128 (RETURN)** will start with 255 lives.

Green Beret:
Type in this listing, and save it for future use. Type **RUN (RETURN)** and load the game with infinite lives.

```
110 PRINT CHR$ (147)
120 FOR I=8192 TO 8230:
READ A: POKE I,A:NEXT
130 SYS (8192)
140 DATA 169, 1, 170, 168,
32
150 DATA 186, 255, 169, 0,
32
160 DATA 189, 255, 169, 0,
32
170 DATA 213, 255, 160, 7,
185
180 DATA 31, 32, 153, 205, 5
190 DATA 136, 16, 247, 108,
36
200 DATA 3, 169, 173, 141,
53
210 DATA 21, 76, 253, 61
```

Exolon:
Load, reset and type **POKE 7427,205 (RETURN). SYS 2061** starts the game with unlimited lives.

Auf Wiedersehen Monty:
Load, reset and type **POKE 21862,76: POKE 21863, 123:POKE 21864,85 (RETURN). SYS 16384** will start the game with unlimited lives.

HORGAN'S HINTS

C64

Pal O Nisja from Norway has sent in these tips.

Kettle:
Load, reset and type ***POKE 65432,230 (RETURN)*** *to become invisible, but Pal says that it may not work on all versions.*

Bounder:
Hold down keys ***1,Q,A,Z*** *and* ***space*** *for 30 seconds to obtain infinite lives.*

Army Moves:
The code for mission 2 is ***15863****.*

Defender of the Crown:
- ★ *First conquer all areas surounding your castle, and don't bother if other saxon lords have them.*
- ★ *After three rounds, go raiding.*
- ★ *After six rounds, buy an army (possibly after four rounds).*
- ★ *Use Robin when you raid.*
- ★ *Don't take any castles if there are more than three lords present.*
- ★ *A good army to conquer with…*
  Soldiers: 45-60
  Knights: 20
  Catapults: 2
- ★ *A good army to have at your castle…*
  Soldiers: 70-100
  Knights: 10-15
  Catapults: 0
- ★ *Only raid lords which have a low swordplay rating.*

Trap:
Hold down shift and type ***RATT*** *(!). We couldn't find a copy of Trap to test it on, so the exclamation mark may or may not be necessary.*

(C16)

These pokes for the C16 come from D. Derby of Spalding in Lincolnshire, but didn't include his full address, so Mr/Miss/Mrs Darby, if you want your T-shirt, better give us your address.

Bounder:
Load the game, press run/stop and reset and type **M1210 (RETURN).** Take the cursor along to the third from the end of the pairs of numbers and type **11 AA (RETURN)** followed by **X (RETURN)** and then **SYS 10608** to start. This allows you to bounce on the chequered floor while still having a good time.

Neville Clarke from Eccles has some pokes for the C16.

Terra Cognita:
Alien destruction is no-longer a problem. Load, reset, and type **POKE 8242,255 (RETURN) POKE 9698,255 (RETURN)** then type **SYS 8192** to start the game.

AMIGA

Here are a couple of tips for those puzzling over the Faery Tale Adventure.

Q: How come I can see the City of Azal, but I can't go into any of the rooms?

A: You need ALL five statues to get into the rooms.

Q: I'm at Swan Island and I've found a swan, but I can't do anything with it…I've tried killing it, that didn't work. I walked around but nothing happened. How do I fly the swan?

A: Kill the witch in Grimwood and she will leave the golden lasso.

Tony Horgan.

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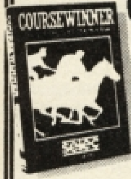

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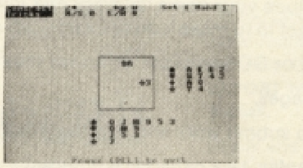

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DTP EXHIBITION 1987

Daphne Moss braved the UK storms and went to find out about what's new on the DTP scene.

Mounting an exhibition — of any kind — in mid-October, in London, usually presents no problem with attendances. There are always the aficianados of whatever is being exhibited, the passing trade and, of course, the ubiquitous tourists to bring the numbers up. Unless that is, you decide to put your exhibition on at the time when the south-east of England is hit by the worst storm in 500 years. That kind of ill-luck hit the Databe's Desktop Publishing Show, which ran from October 15th-17th at the Business Centre in Islington.

I went on the first day, the eve of the 'big blow' and, probably because the rain poured down unceasingly, the attendance seemed pretty sparse.

However 1400 people DID manage to make it even on day two, 'hurricane' day. Maybe they were the ones who lived in concrete jungles where no birds sang and, more importantly, no trees grew! The total attendance at the show was 7500 which, considering the dire weather and travelling conditions was pretty good.

So what did the DTP Show do for me? Not much, I'm afraid. It seemed aimed at 'big-business' rather than the little man — or woman. If you were interested in buying a DTP package worth about £800 or up there were plenty of exhibitors willing to demonstrate their wares but, if you had less than that to spend, they didn't seem particularly worried whether they showed you what was on display or not. (Here I must except Mirrorsoft Ltd who were REALLY helpful even though I said that I only had a limited amount of spend.) Not only that but some of the demonstrators, (so-called), didn't seem to know much about the product they were there to sell, either. I was at one stand when someone asked what was the total amount of memory needed to run a certain program. The question not only flummoxed the demonstrator but also the guy she asked for help as well. (I don't want to boast — O.K. so I do — but I was able to give them all the info. they wanted with the aid of the brochure that was sitting on the counter before their very eyes!)

Amiga Workstation

The DTP packages on view ranged from fairly unsophisticated programs with pretty basic graphics to your multi-user 'environment' which will produce newspapers, commercial magazines and books, and the graphics of which were truly eye-opening. This was true of the Amiga on the Burocare Stand which had an exciting work station at a mere £12,000. It was aimed at advertising agencies and others who want video style presentation and can well afford that level of cost.

There were 50 exhibitors but not all of them were selling DTP packages. Laser printers, workstations, scanners, printers and, of course, books on DTP systems were there, too.

On the final day of the Exhibition the 1st PIRA awards were presented. Six categories covering subjects including Best Newspaper or Magazine, won by Icon Publishing of Newark, Best Non-Professional Publication, won by Link-Up Magazine in Worcestershire, Best Youth Publication, which was presented to Daniel Smith, of Axbridge in Somerset, for his School Newsletters and Best Leaflet/Newsletter/Brochure which was won — would you believe? — by the West Bromwich Albion Football Club Supporters Magazine.

Next year Database Exhibitions are mounting another PIRA DTP exhibition, again in mid-October. I can only suggest that before they finally get under way they offer up a few fervent prayers to the weather gods to look kindly on their endeavours, for an exhibition such as this deserves a bigger public. And if, as I have been reliably informed, the 1988 show WILL cater more for the individual then, with the help of good weather, that is what it will get.

D.M.

★ Program Submission Procedure ★

DO NOT submit any programme or routine that you do not either own or have proper authority to do so.

ALWAYS include your name, address and the date on all material and any enclosures.
Do not forget to to make it clear exactly which computer/s your programme or article is applicable to.

Include ROM or DOS versions wherever they are pertinent.

Number all pages.

If you have to submit work which is hand-written then you must make sure it is printed clearly.

Never use staples. Use paperclips if necessary.
If you are saving your programme to tape then save it AT LEAST twice on each side.
When you save a programme on disk save it twice and call the second file "BACKUP".

Remember to label all tapes and disks with your name and the title of the programme. Label tape or disk with your name and the name or title of the programme.

Always ensure that disks are well packaged. They should ideally be sent in a commercial disk mailer or at least packed between two pieces of hardboard or rigid plastic.

Please allow at least 8 weeks for acknowledgement as all programmes have to be thoroughly tested and made into a suitable format.

Enclose a self-addressed stamped envelope or package if you would like your programme to be returned.

★ Programming tips ★
If you can, use CHR$(x) type commands instead of those hard to read graphic symbols.
If necessary renumber your programme on completion as many readers use auto number utilities to ease typing in.

Try to keep instructions within the programme itself as a sensible level. You can expand on them within the accompanying text if necessary.

TEST your programmes before submitting them or even better get a friend to test them for you.

If a programme contains machine code data please use decimal and not hex as there are fewer digits to be confused. Try and keep the same number of data statements in each line. Please add some form of error checking if your programme contains any more than five lines of data.

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Driller

Incentive

It may not seem like it, but it was almost two years ago that Paul Woakes' excellent Mercenary was released. It wasn't everyones cup of tea, but nothing since has matched its quality of design and gameplay in quite the same way. Although Incentive are making no comparisons between Mercenary and Driller, others no-doubt will.

The big wow about Driller is that is uses Incentive's new system called Freescape. This allows them to design landscapes and objects, and display them in solid 3D from any angle or distance.

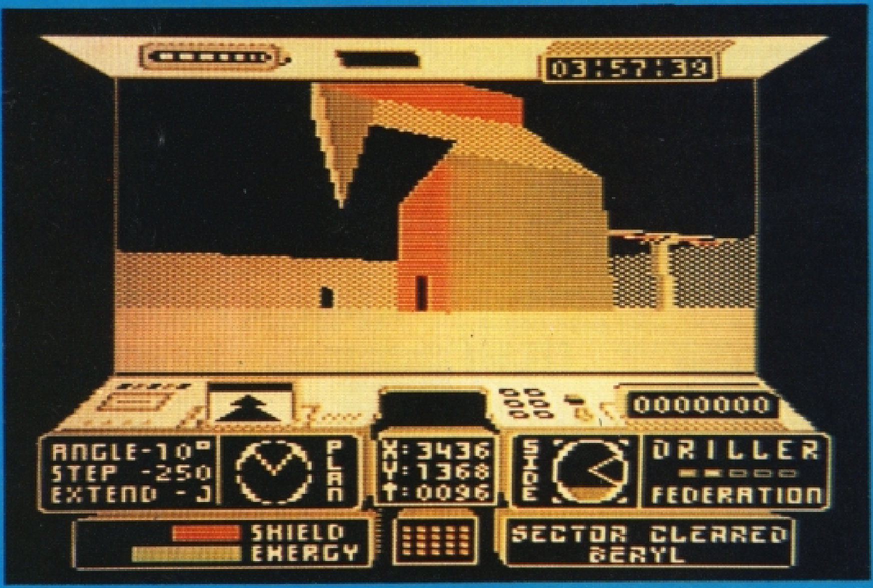
Driller is set on a moon which is in danger of seriously damaging itself because of a build up of dangerous gases beneath its surface. You are assigned the job of releasing these gases, stablizing the moon. The view is from the seat of a tank-like vehicle which can tilt up and down as well as moving around normally. This gives the player the ability to look up at high structures, or down at the floor.

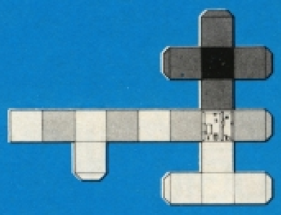
Incentive claims that each section has a possible 20,000 billion screens. I take it that it means there are 20,000 billion different views. We have not yet managed to count them all! On the moon you'll find clues as to where to place a drill. The first is pretty obvious, but later sections require a good amount of thought to decipher the strategically placed objects and buildings.

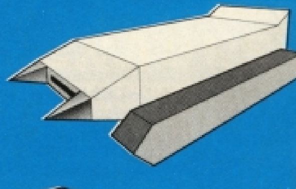
The version we looked at was nearly finished, so I don't suppose the game will be greatly different when it's released. The Freescape system is highly original and can display objects in 3D very competently, but don't expect the speed and smoothness of Mercenary, for example. Driller's puzzles are what will appeal to players, and the solid 3D is a great way of piecing it all together.

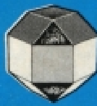
Driller will cost £14.95 on cassette, and £17.95 on disk, and will be out any day now on the popular eight-bit systems, with sixteen-bit versions to follow. They should be something to blow your socks off!

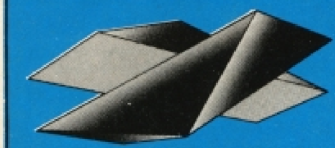
B.V.

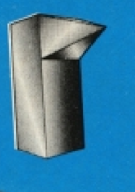

03:57:39
0000000
ANGLE-10°
STEP -250
EXTEND -J
X:3436
Y:1368
↑:0096
DRILLER FEDERATION
SHIELD
ENERGY
SECTOR CLEARED
BERYL

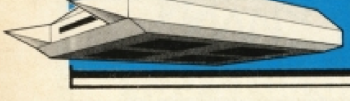


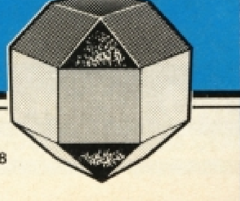


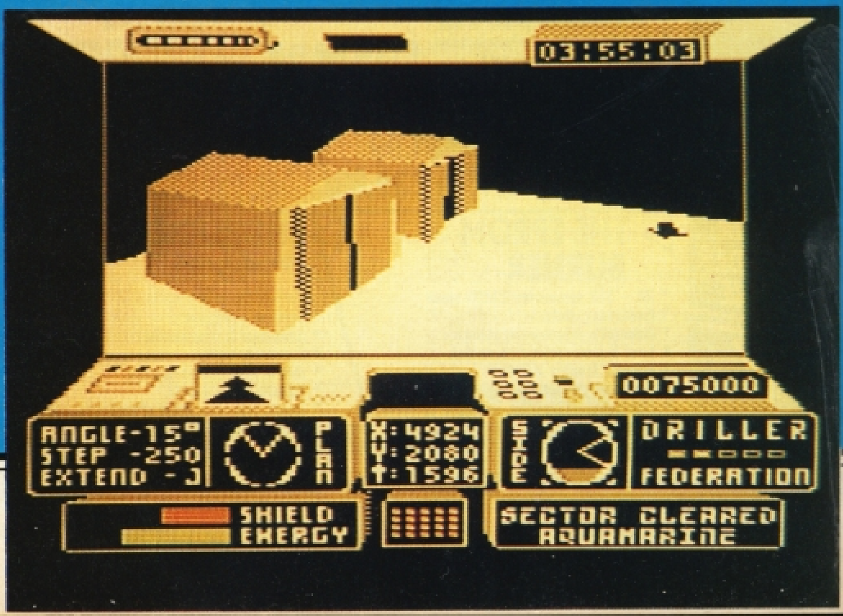











03:55:03
0075000
ANGLE-15°
STEP -250
EXTEND -J
X:4924
Y:2080
↑:1596
DRILLER FEDERATION
SHIELD
ENERGY
SECTOR CLEARED
AQUAMARINE

continued from page 64

```
080
4075 NEXT:na1$=MID$(cm$,k+1):GOTO 4105
4080 FOR i=k+1 TO lc:IF MID$(cm$,i,1)=" "THEN a1$=MID$(cm$,k+1,i-k-1):k=i:GOTO 4
090
4085 NEXT:na1$=MID$(cm$,k+1):GOTO 4105
4090 REM
4095 na1$=MID$(cm$,k+1):GOTO 4105
4100 REM
4105 na$=LEFT$(na1$,5):ac$=LEFT$(a1$,5):li$=LEFT$(l1$,5):vb$=LEFT$(v1$,5)
4107 IF vb$="go" THEN vb$=na$:na$=""
4109 ch=0
4110 FOR i=1 TO nv:IF vb$(i)=vb$ THEN vb=i:GOTO 4120
4115 NEXT i:IF ch=0 THEN ch=1:na$=vb$:vb$=pv$:GOTO 4110:ELSE vb=0:dn$=v1$:GOTO 4
170
4120 IF li$="" THEN 4135
4125 FOR i=1 TO nl:IF li$(i)=li$ THEN li=i:GOTO 4135
4130 NEXT:li=0:dn$=l1$:GOTO 4170
4135 IF ac$="" THEN 4150
4140 FOR i=1 TO nc:IF ac$(i)=ac$ THEN ac=i:GOTO 4150
4145 NEXT:ac=0:dn$=a1$:GOTO 4170
4150 REM sort things out
4151 IF na$="" THEN na=0:RETURN
4155 IF na$="it" THEN na$=pn$:na1$=pp$
4160 FOR i=1 TO nn:IF na$(i)=na$ THEN na=i:GOTO 4190
4165 NEXT i:na=0:dn$=na1$:GOTO 4170
4170 se=1
4175 GOTO 4195
4180 IF ag=1 THEN mess=83:GOSUB 5990:dn=1:se=1:RETURN
4185 IF dn$="" THEN mess=84:GOSUB 5990:dn=1:GOTO 4190
4189 PRINT dw$;x$;dn$;x$;".";:PRINT:dn=1
4190 RETURN
4195 v$=LEFT$(dn$,5):FOR i=1 TO 63:IF v$=vb$(i) OR v$=li$(i) OR v$=na$(i) THEN 4
206
4200 NEXT:GOTO 4180
4206 PRINT dw$;x$;dn$;x$;" in that context.":RETURN
4210 IF ag=1 THEN 4235
4215 an=0:an$="":FOR i=1 TO lc
4220 IF MID$(pk$,i,1)="," THEN an$=MID$(pk$,i+1):cm$=LEFT$(cm$,i-1):pk$=MID$(pk$
,i+1):an=1:GOTO 4235
4221 IF MID$(pk$,i,5)=" and " THEN an$=MID$(pk$,i+5):cm$=LEFT$(cm$,i-1):pk$=MID$
(pk$,i+5):an=1:GOTO 4235
4225 NEXT
4230 IF an$="a" OR an$="again" THEN an$=cm$
4235 GOTO 4040
4275 PRINT "Erm, no.":se=1:RETURN
4280 REM
4285 GOTO 4040
4290 se=1:an=0:ag=0:RETURN
4295 REM start of input routine
4296 p1$=cm$
4305 cm$=""
4310 PRINT "[rev]+[off,cl]";
4315 GET a$:IF a$="" THEN 4315
4320 REM
4325 REM
4330 z=ASC(a$)
4335 IF (z<65 OR z>90) AND z<>32 AND z<>44 AND z<>13 AND z<>20 AND z<>34 THEN 43
15
4340 z1=LEN(cm$):IF z1>75 AND (z<>13 AND z<>20) THEN 4315
4345 IF z1=0 AND (z=32 OR z=44 OR z=13 OR z=20 OR z=34) THEN 4315
4355 IF z=13 THEN PRINT " [cl].":pk$=cm$:RETURN
4365 IF z=20 THEN PRINT CHR$(20);:cm$=LEFT$(cm$,z1-1):GOTO 4310
4380 cm$=cm$+a$:PRINT a$;:GOTO 4310
```

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Program

CRIB 128

This is the missing section of the listing for the CRIB published in CCI December.

```
4920 IF SP(SP)<120 THEN CP(PT)=120:GOSUB 4960
4930 DR=225:IF SP=1 OR SP=2 THEN DR=135
4940 FOR I=1 TO 9:MOVSPR SP,1;DR:NEXT I
4950 BEND:GW=1:RETURN
4960 FOR S1=SP(SP) TO CP(PT)-1
4970 IF S1=30 OR S1=90 THEN BEGIN
4980 PR=90:IF SP>2 THEN PR=270
4990 FOR S2=1 TO 8:MOVSPR SP,1;PR
5000 NEXT S2:DR=180:BEND:GOTO 5110
5010 IF S1=60 THEN BEGIN
5020 PR=90:IF SP<3 THEN PR=270
5030 FOR S2=1 TO 8:MOVSPR SP,1;PR
5040 NEXT S2:DR=0:BEND:GOTO 5110
5050 REM TEST IF PEG HAS TO MOVE
5060 REM BETWEEN BLOCKS ?
5070 IF S1/5=INT(S1/5) AND S1 THEN BEGIN
5080 FOR S3=1 TO 6
5090 MOVSPR SP,1;DR:NEXT S3:BEND
5100 FOR S3=1 TO 4:MOVSPR SP,1;DR:NEXT
5110 NEXT S1
5120 SP(SP)=CP(PT):D(SP)=DR
5130 RETURN
5140 REM SHUFFLE CARDS
5150 SD=0:GOTO 5180
5160 BB$="SHUFFLING CARDS":XL=0:YL=2
5170 SH=15/54:SD=1:B$=BB$:GOSUB 6120
5180 D$=MX$:C$=""
5190 DO:D=LEN(D$):R=FNA(D/2)*2-1
5200 C$=C$+MID$(D$,R,2)
5210 IF SD THEN BEGIN
5220 SD=SD+SH:XL=INT(SD-1):TL=255
5230 B$=MID$(BB$,SD,1):GOSUB 6120
5240 BEND
5250 D$=MID$(D$,R+2,D)+LEFT$(D$,R-1)
5260 R=RND(1):LOOP WHILE D>2
5270 D$=C$:MX$=C$:RETURN
5280 REM
5290 REM SORT CARDS INTO ORDER
5300 LN=LEN(S1$)/2:FOR S1=1 TO LN
5310 S3=S1-1+Q4:S4=S1+5+Q4
5320 I1=S1*2-1:I$=MID$(S1$,I1,2)
5330 K$=LEFT$(I$,1):PI=INSTR(NU$,K$)
5340 K$=RIGHT$(I$,1):PJ=INSTR(B9$,K$)
5350 POKE S3,PI:POKE S4,PJ
5360 NEXT S1
5370 SYS Z(7),LN-1:S1$=""
5380 FOR S1=0 TO LN-1
5390 S3=S1+Q4:S4=S1+Q4+6
5400 S5=PEEK(S3):S6=PEEK(S4)
5410 S1$=S1$+MID$(NU$,S5,1)
5420 S1$=S1$+MID$(B9$,S6,1)
5430 NEXT S1
5440 RETURN
5450 REM CALCULATE POINTS IN HAND
5460 PD=13:TA=0:W$="":GOSUB 6510
5470 N1$="BOX":IF BX=0 THEN N1$="CARDS"
5480 N2$="MY ":IF PT=2 THEN N2$="YOUR "
5490 B$=N2$+N1$:XL=0:YL=2:GOSUB 6120
5500 FOR P=1 TO 4
5510 IF BX THEN T$=BX$(P):GOTO5540
```

The Mystical Machine

J.E. Savage, S. Magidson & A.M. Stein

(Addison-Wesley £16.95)

'The Mystical Machine' is one of the few books that is easy to understand even if the nearest that you've come to reading about the inner workings of your 64 is the 'How To Connect To The Mains', and you've never picked up a book on computers before.

It was written not only for the eager beaver who wants to know as much as possible about computers but also as a primary textbook for a one-semester computer literary course, designed for non-science 'majors' at Brown University, in Providence, Rhode Island, USA, where Savage is Chairman of Computer Science and his two co-authors earned their BA degrees. It is written in deceptively simple language, conveying the meaning clearly and concisely and, you quickly begin to realise that computers aren't the intricate and complex pieces of machinery that you thought they were. (Of course the ARE, but this book makes them seem easy to understand). Each chapter goes into the subject matter with a depth and clarity which even the complete beginner can comprehend. At the end of each chapter there's a summary of what has gone before, a list of books suggested for further reading and an 'Issues & Ideas' questionnaire to test your powers of assimilation.

What I liked about 'The Mystical Machine' is that it takes the mystery OUT of the computer. It explains how then came to be invented, who did what to advance them even further and then goes on to demonstrate programs, and shows how to write them, in ASCII, BASIC, PASCAL, — even FORTRAN, COBOL and LISP.

The authors help you de-bug your programs, illustrate software systems and, in one sub-chapter that I particularly enjoyed, demonstrate a program called 'DOCTOR', written in LISP, (LIST PROCESSING LANGUAGE). 'DOCTOR' — whose most famous version, it appears, is called ELIZA — conducts a conversation with the user asking questions related to the users previous responses. For example, part of the program asks:

Q: 'What can I do for you today?'
A: 'I feel sad.'
Q: 'Tell me more about your sad feeling'.
A: 'I don't feel well.'

The program goes on to finally discover, through the question and answer sequence, that the user hates to get up in the morning. (Don't we all?)

Games, too, are not neglected. Nor are spreadsheets, management systems and software piracy — a subject which the authors, naturally, abhor. This book is not just a good read. There are numerous colour and black and white illustrations, sketches and drawings, which help to clarify the printed word and make it far more interesting, too. Altogether one of the few books about computers, and how they work, which really does help the reader — novice or advanced student alike — to get to grips with the basics (no pun intended!), and really understand the 'Mystical Machine'. **D.M.**

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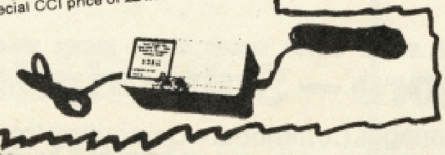

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Charts

Ocean's — sorry — Imagine's Renegade stays up in the coveted number one spot and Firebird's Bubble Bobble hangs in there in the second spot — both for the second month running. Some real breakers this time though with five new games entering led by another Ocean scorer Freddy Hardest. Christmas buying (what do you want for a present, Jimmy? Would you like a computer tape? I'll buy you one with a pretty picture on it, too) means compilations (lots of games on one tape, Jimmy!) and three make it in led once again by an Ocean pack, Game Set and Match. But the really big names will no doubt strike next month. (Outrun?) In the Budget Chart, Kickstart II jumps a place to the top spot and there is a new number two for Firebird's Arcade Classics compilation (a compilation for £1.99! It's Firebird's Xmas present to everybody!).

The Amiga Chart gets a new leader, too, with Audiogenic's making it to number one with the impressive Impact. There is also a new entry for Goldrunner from Microdeal. Watch out for Insanity Fight from the same programmers.

C64

GAME TITLE	COMPANY		Price	Rating
1 Renegade	Imagine	—	£8.95	Crisp
2 Bubble Bobble	Firebird	—	£9.95	Crisp
3 World Class Leaderboard	U.S. Gold	↑	£9.99	Mega
4 Freddy Hardest	Imagine	★	£8.95	T.B.A.
5 Indiana Jones	U.S. Gold	★	£9.95	Iffy
6 Game Set and Match	Ocean	★	£9.95	Mega
7 Hysteria	Software Projects	★	£8.95	Awesome
8 Beau Jolly	Comp Hits	★	£9.95	T.B.A.
9 Pirates	Microprose	—	£14.95	Mega
10 Live Ammo	Ocean	★		Crisp

Budget Chart

1 Kikstart II	Mastertronic
2 Arcade Classics	Firebird
3 Joe Blade	Players
4 MicroRhythm Plus	Firebird
5 Soccer Boss	Alternative

Amiga Chart

1 Impact	Audiogenic	£24.95
2 Terrorpods	Psygnosis	£24.95
3 Gold Runner	Microdeal	£19.95
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The 'Kickstart Guide to the AMIGA

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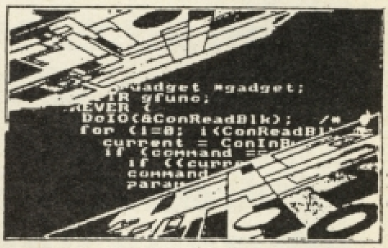
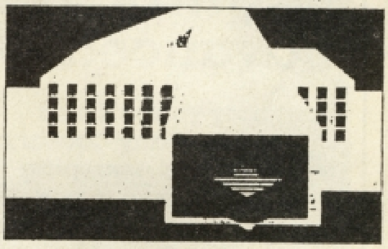


```
   adget *gadget;
  TR gfunc;
EVER {
 DoIO(&ConReadBlk);   /*
 for (i=0; i<ConReadBl
   current = ConInB
   if (command ==
      if ((curr
      command
      para
```



When Commodore sent out the first issue of "Kickstart — the European Technical Journal" it was hailed as the first thing to explain the machine in a way which was comprehensible to a human being, instead of just to another Amiga!

The Commodore Amiga is probably the most advanced wide-market Microcomputer ever produced, both in terms of hardware, and in terms of the system software. The Amiga uses a state-of-the-art message-passing multi-tasking Operating Environment — while this is responsible for a lot of the machine's power, it is also a rich source of confusion to programmers used to comparitively primitive micros.

Aware of this, Commodore commissioned Ariadne to produce the "Kickstart" journal, which was distributed to all European developers. Particularly well received were a series of feature articles, which explained the key concepts of the machine in a way which didn't assume you knew about them already, and which were designed to complement the official documentation as much as possible.

Now with the release of the A500 another group of programmers are eagerly approaching the Amiga. Ariadne have therefore taken the feature articles from Kickstart, revised and updated, them, and added new material appropriate to a wider audience — the result is this book.

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A ROME OF YOUR OWN

John Ransley thinks that war may become a matter of faxing 3D holographic computer games to your enemy. Here he examines two slightly less technologically advanced wargame simulations.

Fancy yourself as a modern-day Caesar or Augustus, sweeping imperiously and victoriously across Europe, with all bowing before you? Forget it — you'd never cope with the paperwork. It was easy for the original sculptors of the Roman Empire. If they fancied a quick bit of colonization, they had only to despatch a couple of messengers and there would be hordes of legionaries in leather minis bombing down the Appian Way quicker than you could polish off a pepperoni.

Try the same kind of direct action today and even if your army endured the boredom of queuing at the check-in, they'd never survive the inevitable Vesuvius of documentation covering emigration, export licences and vaccination. Moving huge volumes of personnel and equipment around Europe just isn't an efficient way of fighting wars any more. Nuking is too graceless and, besides, it would spoil the vintage. When we get the technology right, perhaps future wars will be a matter of the foes faxing each other with 3D holographic computer games featuring pre-agreed targets, for zapping by the joystick equivalents of those viciously competitive preadolescents who cream each other at international gymnastics.

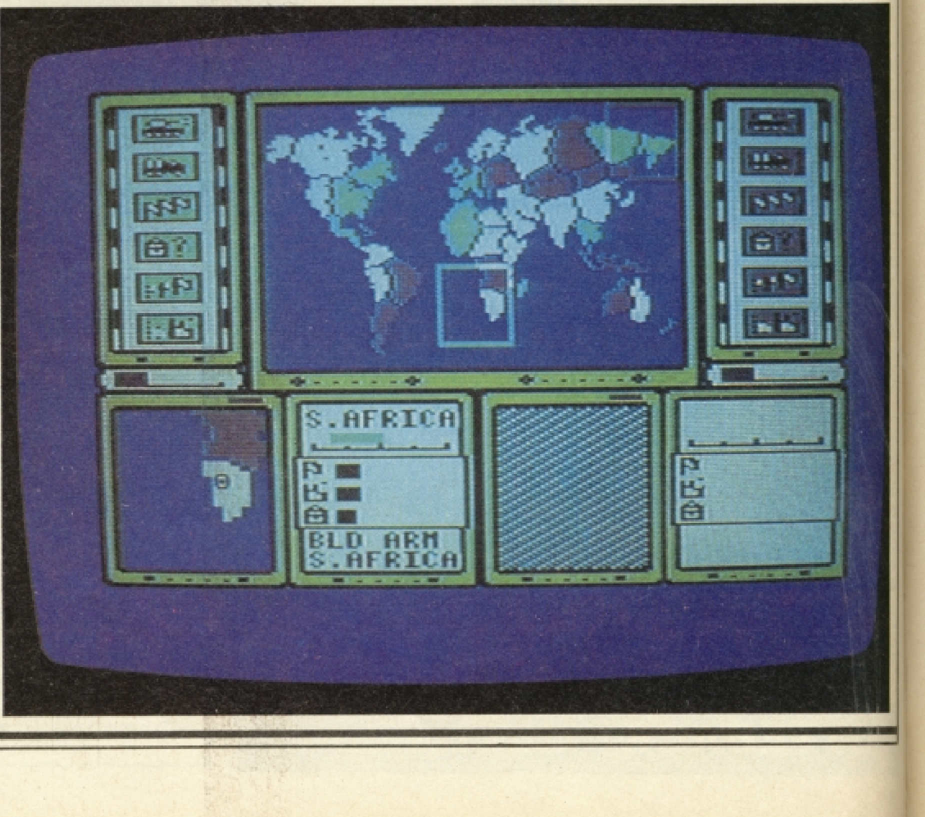
For the moment, those of us who enjoy a few centuries of good old-fashioned combat with not so much as a neglected verruca to show for it, there is a varied library of strategy games from S.S.I. and PSS covering practically every theatre or war staged over the past 3,000 years or more, from Gallia to Goose Green.

Annals of Rome from PSS gives you the status, power and no doubt fallibility of an emperor in balancing the aspirations of the Senate with the logistics of conquest in a game that makes up in authenticity anything that it lacks in graphic presentation.

Following the convention of eight game turns per century, this challenge has you pitting your wits against as many as 3 hostile power simultaneously, though with a huge number of legionaries, auxiliaries and limitanei at your disposal under the command of 21 officers, you can be sure that the result will never be a draw.

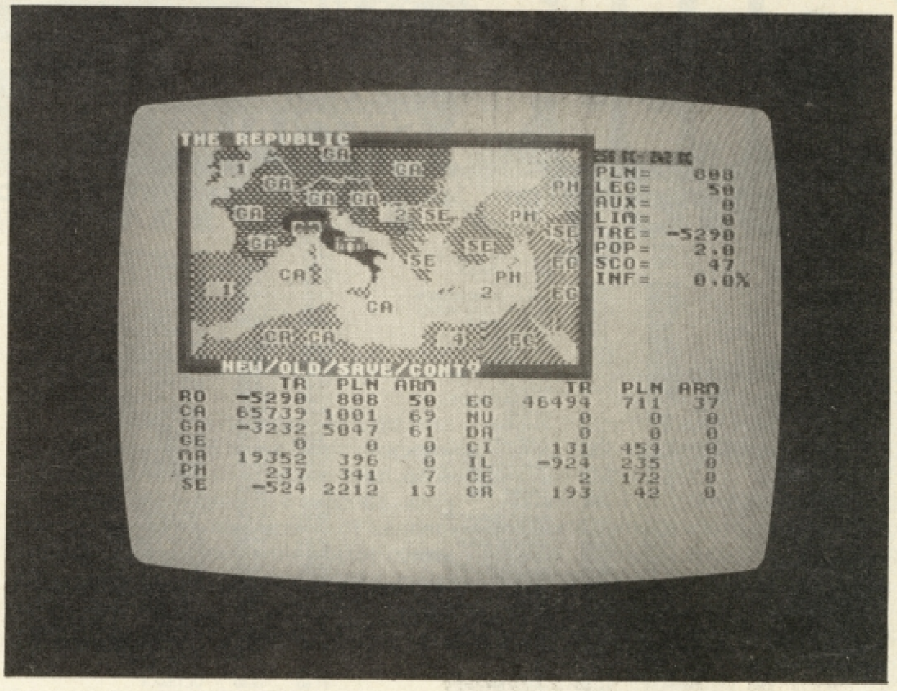
The initial set-up routine involves choosing a level of taxation (on which other aspects of your economy are automatically calculated) and establishing the initial status, location, ability and loyalty of your senators and commanders. Thereafter, use your skill to reassign officers, identify those commanders who are likely to plot rebellions against you, buy yourself more loyalty, fight or sidestep civil wars — all in your quest finally to try to conquer 28 foreign territories.

Game display takes the form of a quarter-screen map of each region peppered with status flags plus an initially overbearing volume of alphanumeric data that looks like something out of a nightmare Peter Gerrard might have had after a bad date with a machine code disassembler. The display cleans up a little once the parameters are set, but it remains uninspiring, when even the introduction of a customised character set would have done much to give a little



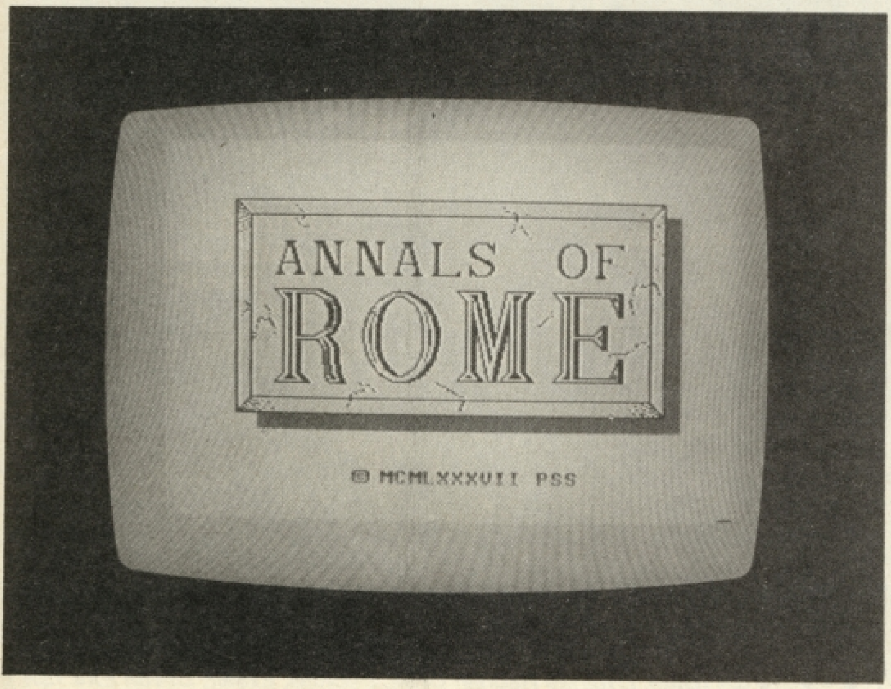
more character to what is undeniably a carefully programmed and responsive offering.

Otherwise, Annals of Rome is as friendly as a warmonger can be, offering the option to pre-test bad moves by dumping a game in progress to disk at any stage, and with the provision of an exhaustively thorough, and legible, 16-page player's guide that does away with the need for tiresome screeds of on-screen instructions. Annals of Rome, like any reasonably realistic micro strategy game, requires chess-like premeditation and no small degree of numeracy and precise keyboard input on the part of the player. It won't appeal to the confirmed zapper, but it moves along fast enough to hold the interest of even the novice wargamer.



```
THE REPUBLIC                              PLN=     808
                                          LEG=      50
                                          AUX=       0
                                          LIA=       0
                                          TRE=   -5290
                                          POP=     2.0
                                          SCO=      47
                                          INF=    0.0%
      NEW/OLD/SAVE/CONT?
          TR   PLN  ARM            TR   PLN  ARM
RO     -5290   808   50    EG   46494   711   37
CA     65739  1001   69    NU       0     0    0
GA     -3232  5047   61    DA       0     0    0
GE         0     0    0    CI     131   454    0
MA     19352   396    0    IL    -924   235    0
PH       237   341    7    CE       2   172    0
SE      -524  2212   13    CR     193    42    0
```

Annals of Rome
PSS £12.95 (£17.95 disk)



Also from the PSS stable, Power Struggle offers budding megalomaniacs another crack at world domination, but strictly for fun. A couple of keystabs or jabs on the joystick and you're in business. Playing against the computer or another player, you control a jumbo box cursor that (literally) whizzes over a map of the world, which is colour coded as having West, East or neutral affiliations. They change randomly every game, and if you don't like the initial balance, another stab will alter it before play starts.

Both sides have a choice of six icon-selected actions at every move. Using a secondary cursor on an enlarged map of the area, you can attack, supply, support, deneutralise, arm or industrialise any country, with the aim of influencing as many as you can to change their political colours to yours. A countdown discourages too much statesman-like dawdling. After every move, the program will evaluate its implications and either recolour terriorities as appropriate or end the game and declare the winner.

The apparent simplicity of gameplay is deceptive. If your combatant is the computer, it swiftly and unmercilessly targets mistakes and miscalculations; a human opponent may be less unerring, but at least all the information is before you both, as in a chess game; only your interpretation of those facts will decide whether you will be the victor or the vanquished.

Screen display is adequate, though the map graphic on the 64 version tested were chuckyish, and the speed at which both cursors moved made them difficult to control, frequently causing unwanted selections. An option to alter both cursors' velocity using, say, the 1-9 keys would be a welcome refinement on future versions. That niggle apart, Power Struggle is not at all a bad choice for the (possibly younger) gamer looking for a fairly effortless way of sampling the world of bloodless battling.

Power Struggle
PSS £4.99 (£9.99 disk)

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Phantom Drive Enhancement System

Want to speed up your 1541: ? Len Keighley looks at aTrilogic add-on.

As everyone knows Commodores 1541 disk drive is one of the, if not the, slowest drive on the market. However, Trilogic the Bradford based hardware 'addon' manufacturer, has aided to its range of products a device which overcomes this problem, as well as adding many extensions to the operating system. The method of overcoming the slow speed is to utilise a turbo load and paralled I/O process.

The new device is called the 'Phantom Drive Enhancement System' and the package consists of a replacement kernal chip for the C64 or 128, an additional circuit board for the 1541, a parallel cable and some micro chips, also for the 1541. In addition, at present, a disk copier entitled Doppelganger which makes use of the Phantom parallel I/O.

Initially the work involved in installing the parallel system looks daunting for an amateur but full instructions are supplied and Trilogic are happy to help by phone. The replacement kernal chip, different for the C64 and C128, has a switch attached to toggle between the Phantom and normal kernals. The Phantom only works on the 128 in 64 mode. The parallel cable connects the new circuit board for the 1541, to the User Port on the C64/128. The micro chips are used to connect some of the pins on two the existing 1541 chips to the new circuit board. The circuit board itself replaces a further two of the original 1541 chips, in slots UC3 and 11C4, which are then inserted in vacant slots on the new circuit board. When all is reconnected including the serial cable and power is switched on. Phantom carries out some error checking which will inform of any mistakes in installing the new hardware. This is done by the number of flashes made by the real status LED. A note here for anyone having doubts about the fitting, the hardest part is the fitting of the micro chips. These are quite awkward as they end up underneath the new circuit board. Having completed the fitting the Phantom kernal displays a new initial surcon, upon which the colour selection may be changed back to the original two tone blue.

Once fitted the decrease in load time is dramatic. A 135 block Basic program, which takes 87 seconds to load on a standard 1541, loads in 6 seconds using Phantom. The disk version of Leaderboard World Classic which takes nearly 4½ minutes (267 seconds) to load on the standard drive is reduced to less than one minute (55 seconds).

DOS Wedge

The increase in disk I/O speed however, is only a small part of the additional features provided by Phantom. Trilogic have taken the opportunity to enhance the C64 kernal. A DOS wedge has been included which reduces the input necessary to initiate disk commands. The Function kets have also been programmed to allow single key commands. These can be switched off to avoid conflict with software function key usage. Other control keys have been included for a soft reset, an escape from Quotes/Reverse/Insert and a halting of screen scroll. The load, Save and Verify commands have had a Turbo feature included which is used in conjunction with the parallel I/O. To ensure the new kernal is compatible with all forms of software different aspects can be switched off to allow the software to run.

The Phantom circuit board has a new DOS included which enhances and extends the command features. These can be sectioned via the DOS wedge included in the kernal. New commands include the setting of the device number, a reset and a return to a standard 1541 drive. However, the most interesting change allows the Write Protect process to be ignored, which means that the reverse side of a disk can be used without the need to notch the disk. This feature can be switched on permanently, till the drive is switched off, or till the disk is changed. The existing Initialise, Format and Validate commands have been enhanced. The Initialise will now display, learn or remember the DOS version of the loaded disk. The New command will now allow the formatting of a full 40 tracks thereby increasing the number of blocks available on a disk to 749. The Validate will now allow read errors to be removed from the disk by having the offending sectors designated as used in the BAM.

A set of File commands has been included, some of which allow files to be locked thereby avoiding accidental deletion, utility commands such as a Compact directory, write protection of a disk have also been included. If this s not enough, the DOS error messages habe been enhanced to give more meaningful information. A DOS Monitor is included to allow advanced programmers to take advantage of the microprocessor that controls the 1541, this provides almost the same codes as a monitor for the computer itself.

Doppelganger

Finally, Trilogic have included a disk containing the software backup program Doggelganger. This uses the parallel I/O of Phantom to make a true copy of each byte. This means that it does not require great amounts of processing to carry out protection anaylsis. It's only restriction is the perhancmance and accuracy of the drive itself and alignment may be required before copies can be made.

It is not possible in a review to do justice in the full potential provided by Phantom.. As an example of its sophistication, if the parallel cable is not connected, Phantom reverts to standard social I/O with of course a loss of I/O speed. The rest of £78.99 is relatively high but this does include the disk copier, Doggelganger, valued at £20.

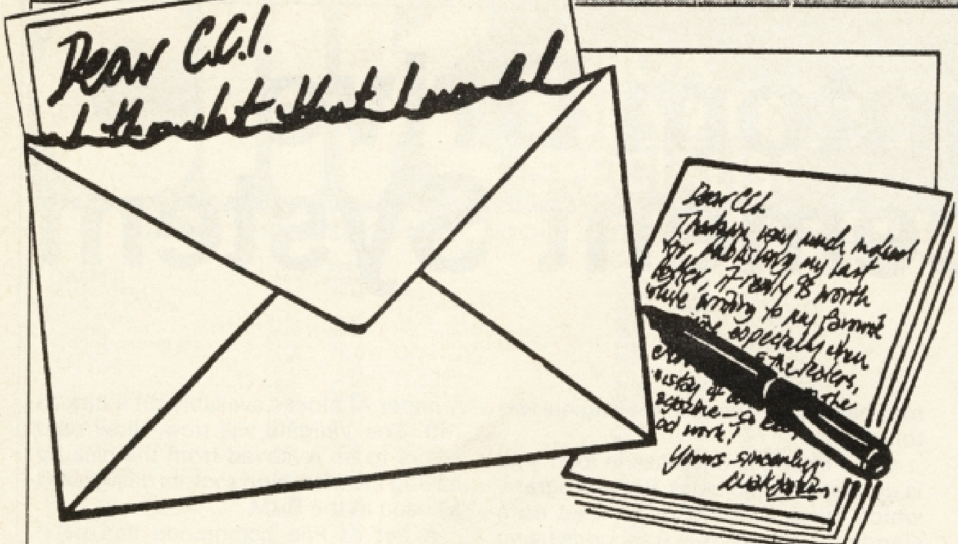
Further enhancements are catered for in additional slots and connectors on the 1541 circuit board, and upgrades for all parts DOS, kernal and copier, at a nominal change, will be available.

Phantom is fully compatible wiht Trilogic's Expert cartridge but may need to be disabled for use with other types of backup software and hardware.

Trilogic are to be commended for the thought and expertise that has gone into Phantom and perhaps next year they will collect one of CCI's awards for that effort.

L.K.

write on... and on... write on...


Dear C.C.I.
I thought that I would

Dear CCI
I am in the process of setting up a new software users group for owners of the Amiga and Atari ST computers. Membership will be totally free and there won't be anything to pay at any time. We are looking for new members all over the UK and anywhere else in the world. If anyone is interested please write enclosing an SAE.

My telephone number is 05827-69152. I am available on this number after 6.30pm and weekends.
Yours Faithfully,
R. Bhattacharya, 3 Wensley Close, Harpenden, Herts AL5 1RZ.

Dear Sir
As a Commodore 64 owner who uses his machine both for business and pleasure, I regularly buy your magazine as it seems to offer the best value for money and the best all round coverage of Commodore matters; although I would like to see more information on business software as the majority of non-games related articles seems to be for the benefit of people with programming knowledge rather than for those of us who want to get more use from our machines but who are not mentally equipped to learn how to program them.

The only item that I can recall getting any decent coverage was Mini Office II, which incidently I have found to be a fantastic package at such a low price.
Yours faithfully,
Bill Randall

Dear Bill
Among the something like 100,000 + CCI readers there seem to be as many different opinions. Some write to us complaining the material we publish is not technical enough! Or that there is not enough — or too much! games coverage and so on. As for business, the problem is that there is very little being produced now on this side of the atlantic. We are trying to get 64/128 business software from the U.S.A. but no doubt then we'll get complaints that it's not U.K originated! But watch these pages, you will be getting whatever there is.

Dear CCI
I have been searching for "Clumbsy Colin Action Biker" for the Commodore 64. Can you help?
Stewart Robertson
19 Auchen Hove Crescent, Kilibirnie,
Ayrshire KA25 7HB Scotland

Dear Stewart
Frankly, we've never heard of it, but we're sure some C.C.I. reader has. So please contact Stewart direct, all you Clumbsy Colin players.

Dear CCI
As I said to the princess only the other day, "This 'living happily ever after' business is all very well but the odd bit of *slaughter* did *liven* things up a bit!"

"Oh, Julian," she says with a sigh, "you're missing all that excitement aren't you sweetie, all that turtle — surfing and swanning around — and then to have killed the wiz' and rescued me, without ever getting killed even once — coo, lummee! — it's just like you've been through a real Faery Tale. Anyway," she says, "I suppose combatting evil and things does get into your system, ah well — you probably don't think so now but something just as interesting could turn up again."

"I know!" she goes on, "'til it does, why don't you write to that nice CCI or whatever magazine you were reading and ask if anyone needs a bit of help or some hints — and if they sent you a stamped addressed envelope you wouldn't need to even use any of our gold — and you need *something* to do —anyway — how long is 'ever after' and didn't you say you have 65 lives. Oh yes, while I think of it; why don't we take the raft out on the lake this afternoon, or we could go and get one of those magic boxes you wanted, your Kevin was just saying, they only cost a meagre 500 . . . Hrrrmmm!
Yours sincerely
B. P. Johnson

Wow! Verily a strange letter! I suppose this is thy way of offering help on that Amiga masterpiece Faery Tale Adventure. Anyone stuck on the game can write to: Brian Johnson, 2 Block X, Peabody Avenue, Pimlico, London SW1V 4AY. Forsooth he may aid and abet thee to avoid a jump in the lake . . . and bring your gameplay to a faery tale ending! Worth a stamp indeed!

Dear CCI
Congrats on a great mag, it is undoubtedly the best you can buy in Australia. Unfortunately we can't do any of the comps, because we get it so late.

What's all this charging us £38 ($80) for twelve magazines, it costs $3.80 to buy one down here, twelve would cost me £45.60.

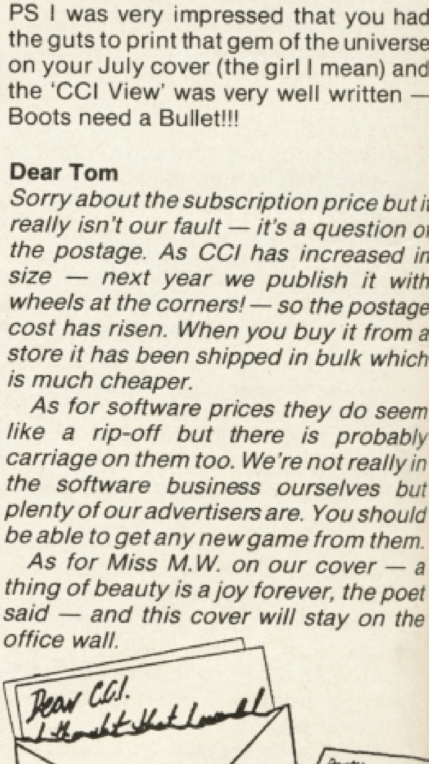
I have a big problem, games here are a total rip off (I own a C64 by the way), 'Westbank' costs $25 ($12.50) and Arkanoid costs $50. Would it be possible to print a catalogue each month, of the top 20 games released that month, along with an order form?

Please print this as I'm sure many other Aussies have the same problem.
Thanks
Tom O'Brien, Australia
PS I was very impressed that you had the guts to print that gem of the universe on your July cover (the girl I mean) and the 'CCI View' was very well written — Boots need a Bullet!!!

Dear Tom
Sorry about the subscription price but it really isn't our fault — it's a question of the postage. As CCI has increased in size — next year we publish it with wheels at the corners! — so the postage cost has risen. When you buy it from a store it has been shipped in bulk which is much cheaper.

As for software prices they do seem like a rip-off but there is probably carriage on them too. We're not really in the software business ourselves but plenty of our advertisers are. You should be able to get any new game from them.

As for Miss M.W. on our cover — a thing of beauty is a joy forever, the poet said — and this cover will stay on the office wall.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JOYSTICK INTERRUPT

by John Consadine

C-64

A nice machine code routine that will enable BASIC programmers to incorporate a joystick driven sprite into their programs. It is small and simple to use. Also included is a short demonstration program to show it at work.

This is a machine code, interrupt driven, routine which allows you to move sprite 0 anywhere on the screen with the joystick in Port 2.

It loads into the spare 4K RAM and if RUN/STOP — RESTORE is pressed it can be reactivated at any time with SYS 49152. A Demo program is included to show it in operation.

Its features can be modified as follows:

1. SPEED-POKE 49153, SP where SP is usually any number between 2(slow) and 30(v. fast). The default setting is a value of 10.
2. You can limit the movement of the sprite, say to leave a couple of lines free at the top for score, lives etc., in your game by POKE 49236,LIM. LIM is currently set at 48 (Top of screen). Try LIM = 58 or 68 to given one or two lines free. A value of less than 48 will allow the sprite to move off the top of the screen.
3. Similarly, the movement off the R.H.S. can be adjusted by POKE 49214,RT. RT is currently set at 64. A smaller value will limit movement to the right, whereas a larger value will allow the sprite to move off the R.H.S.

This routine should allow a programmer to concentrate on games design without worrying about how to move his character around the screen. An added bonus is that a game written in basic will run much faster as the main sprite character is machine code controlled.

```
1 REM ************************
2 REM *                      *
3 REM *  JOYSTICK INTERRUPT  *
4 REM *                      *
5 REM * J. CONSADINE SEPT 87 *
6 REM *                      *
7 REM ************************
10 L= 49152
20 FOR X=0 TO  7 :T=0:FOR Y=0 TO 14
30 READ A:IF A <0 OR A >255 THEN 60
40 POKE L,A:L=L+1:T=T+A:NEXT
50 READ A:T=T-(INT(T/256)*256)
60 IF T<>A THEN PRINT"DATA ERROR IN LINE"1000+(X*10)"CHECKSUM <>"A:STOP
70 PRINT 1000+(X*10)"OK":NEXT
1000 DATA 169,010,133,253,133,254,120,169,019,141,020,003,169,192,141,  134
1010 DATA 021,003,088,096,173,000,220,041,015,170,189,105.192,024,109,  166
1020 DATA 000,208,172,016,208,192,000,208,018,201,023,240,033,201,255.  183
1030 DATA 208,026,160,001,140,016,208,169,000,076,073,192,201,255,240,  173
1040 DATA 007,201,064,208,008,076,076,192,160,000,140,016,208,141,000,  217
1050 DATA 208,189,121,192,024,109,001,208,201,048,240,007,201,230,240,  171
1060 DATA 003,141,001,208.198,254,208,177,165,253,133,254,076,049,234,  050
1070 DATA 000,000,000,000,000,001.001,001,000,255,255,255,000,000,000,  000
```

```
1 REM ************************
2 REM *                      *
3 REM *    JOYSTICK DEMO     *
4 REM *                      *
5 REM * J. CONSADINE SEPT 87 *
6 REM *                      *
7 REM ************************
10 SPEED = 49153                                  :REM POKE TO CHANGE SPEED
20 LIMIT = 49236                                  :REM POKE TO CHANGE LIMIT
30 VIC = 53248                                    :REM START OF SPRITE AREA
40 FOR X=0 TO 62:POKE 832+X,255:NEXT              :REM CLEAR SPRITE
50 POKE 2040,13                                   :REM SPRITE DATA POINTER
60 POKE VIC+21,1                                  :REM TURN SPRITE ONE ON
70 POKE VIC+39,0                                  :REM SET SPRITE ONE'S COLOUR
80 POKE VIC,167:POKE VIC+1,140                    :REM POSITION SPRITE ONE
90 POKE SPEED,10                                  :REM SET SPEED
100 POKE LIMIT,58                                 :REM SET LIMIT
110 SYS 49152: PRINT CHR$(147);                   :REM CALL ROUTINE/CLEAR SCREEN
120 PRINT "HITS LEFT"L"       HITS RIGHT"R        :REM PRINT NO OF HITS MSG
130 POKE 1513,81:POKE 1533,81                     :REM PRINT TARGETS
140 IF PEEK(VIC+31) AND 1=1 THEN GOSUB 160        :REM TEST FOR COLLISION
150 GOTO 140                                      :REM NO COLLISION SO LOOP
160 IF PEEK(VIC)<130 THEN L=L+1                   :REM WAS IT LEFT TARGET
170 IF PEEK(VIC)=>130 THEN R=R+1                  :REM OR WASI IT RIGHT
180 T=1-T:POKE VIC+39,T                           :REM TOGGLE COLOUR
190 FOR X = 1 TO 50:NEXT                          :REM SLOW THINGS DOWN A BIT
200 POKE VIC+31,PEEK(VIC+31) OR 1:PRINT CHR$(19); :REM RESET COLLISION BIT
210 PRINT "HITS LEFT"L"       HITS RIGHT"R        :REM PRINT NO OF HITS
220 RETURN
```

NO BORDER SCROLL

by Peder Norrby

From Sweden!

C-64

Peder has thrown down the gauntlet! He has challenged Richard Franklin (of MINI OFFICE & CCI fame) and anyone else who dares, to see who can produce the most specatacular demo or effect on a C-64. He has sent us his Mega smooth borderless scroll to show us what we are in for. We must admit it is good . . . but is it the best?

Hello you mega-dudes!

Last week I was skimming through your mega-mag. Then I saw a proggie made by professional programmer Richard Franlin (never heard of him!). Then I thought "Hell Ho! It's time to show the world what I can do!" "What can I do?", "Well, how about a no border scroll?" I stayed up all night to finish that routine. And here it is!

It's even shorter than Mr. Franklin's text scroll.

You can poke these:

POKE 49409,speed (1 or 2)
POKE 49578,text start high
POKE 49576,text start low
POKE 49632,border colour (0-15)
POKE 49633,paper colour (should be same as border)
POKE 49633-49646,sprite colours

It'd just freak out if you'd mention it is your magazine!

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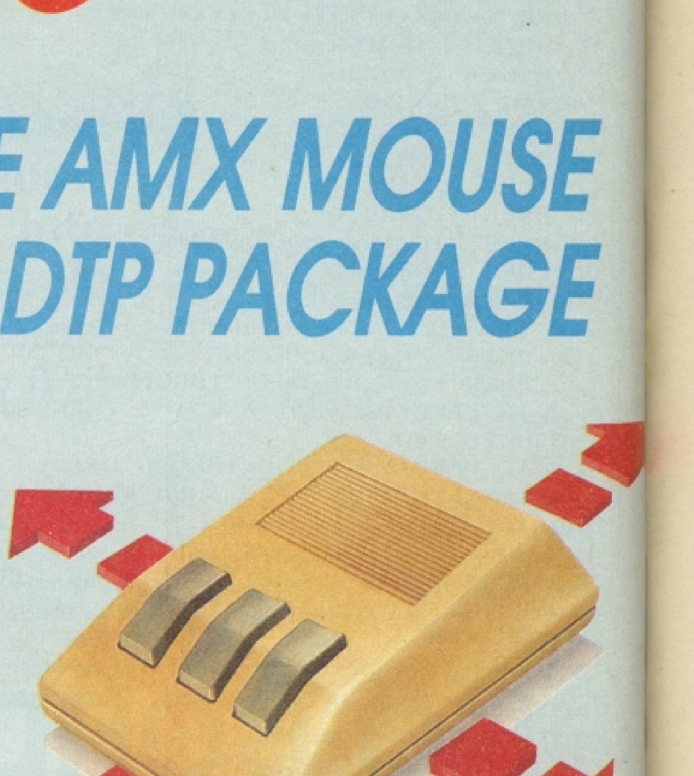

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This highly attractive combination of AMX Mouse and STOP PRESS Desk Top Publishing system offers you a very low price entry into the exciting world of desk top publishing for the Commodore 64 and 128 computers.

Please make your order as soon as possible as supplies are limited.

```
 0 REM ********************
 1 REM *                  *
 2 REM * NO BORDER SCROLL *
 3 REM *                  *
 4 REM *  BY THE U-MAN     *
 5 REM *                  *
 6 REM * LOOK IN THE DATA *
 7 REM * TO CHANGE SETUP  *
 8 REM *                  *
 9 REM ********************
10 L= 49152
20 FOR X=0 TO  33 :T=0:FOR Y=0 TO 14
30 READ A:IF A <0 OR A >255 THEN 60
40 POKE L,A:L=L+1:T=T+A:NEXT
50 READ A:T=T-(INT(T/256)*256)
60 IF T<>A THEN PRINT"DATA ERROR IN LINE"1000+(X*10)"CHECKSUM <>"A:STOP
70 PRINT 1000+(X*10)"OK":NEXT
80 GOSUB 2000
90 PRINT:PRINT"SYS 49152 TO START SCROLL"
100 PRINT"PRESS ANY KEY TO EXIT SCROLL":END
1000 DATA 120,162,046,189,000,208,157,000,207,202,016,247,162,000,138, 062
1010 DATA 157,000,200,157,000,201,157,000,202,232,208,244,162,007,189, 068
1020 DATA 216,192,157,248,199,202,016,247,032,128,192,088,165,203,201, 182
1030 DATA 064,240,250,201,001,240,246,032,183,192,096,000,169,001,141, 008
1040 DATA 025,208,169,021,141,017,208,169,148,141,000,221,162,046,189, 073
1050 DATA 192,193,157,000,208,202,016,247,162,007,202,208,253,162,010, 171
1060 DATA 206,022,208,238,022,208,160,004,136,208,253,234,234,234,234, 041
1070 DATA 202,208,238,032,000,193,162,046,189,000,207,157,000,208,202, 252
1080 DATA 208,247,032,144,192,076,049,234,032,167,193,169,000,141,255, 091
1090 DATA 063,141,255,255,169,001,141,025,208,169,001,141,026,208,169, 180
1100 DATA 249,141,018,208,173,017,208,041,127,141,017,208,162,057,160, 135
1110 DATA 192,142,020,003,140,021,003,169,000,141,014,220,169,151,141, 246
1120 DATA 000,221,096,120,162,049,160,234,142,020,003,140,021,003,162, 253
1130 DATA 046,189,000,207,157,000,208,202,016,247,169,001,141,014,220, 025
1140 DATA 088,096,000,000,000,000,032,033,034,035,036,037,038,039,000, 212
1150 DATA 000,000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000
1160 DATA 000,000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000
1170 DATA 000,160,002,162,000,024,062,026,202,062,218,201,062,217,201, 063
1180 DATA 062,216,201,062,154,201,062,153,201,062,152,201,062,090,201, 032
1190 DATA 062,089,201,062,088,201,062,026,201,062,025,201,062,024,201, 031
1200 DATA 062,218,200,062,217,200,062,216,200,062,154,200,062,153,200, 220
1210 DATA 062,152,200,062,090,200,062,089,200,062,088,200,062,026,200, 219
1220 DATA 062,025,200,062,024,200,232,232,232,224,024,208,173,206,255, 055
1230 DATA 207,136,208,165,173,255,207,240,001,096,169,008,141,255,207, 164
1240 DATA 160,000,177,254,240,057,234,234,010,038,253,010,038,253,010, 176
1250 DATA 038,253,133,252,165,253,024,105,216,133,253,120,169,051,133, 250
1260 DATA 001,162,000,160,000,177,252,157,026,202,232,232,232,200,192, 177
1270 DATA 008,208,243,169,055,133,001,088,230,254,208,002,230,255,032, 068
1275 REM                          ↓↓↓ HI BYTE OF TEXT START
1280 DATA 175,193,096,162,000,160,194,134,254,132,255,169,000,133,253, 006
1285 REM                  ↑↑↑ LOW BYTE OF TEXT START
1290 DATA 133,252,169,008,141,255,207,096,000,000,000,000,000,241,250, 216
1300 DATA 041,250,089,250,137,250,185,250,233,250,025,250,073,250,193, 166
1310 DATA 021,249,000,000,255,200,000,021,001,001,000,000,255,000,000, 235
1315 REM  VVV VVV BACKGROUND COLOURS
1320 DATA 000,000,000,000,000,000,000,001,001,001,001,001,001,001,001, 008
1325 REM               SPRITE COLOURS ↑↑↑ ↑↑↑ ↑↑↑ ↑↑↑ ↑↑↑ ↑↑↑ ↑↑
1330 DATA 000,000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000
2000 A$=A$+"THE U-MAN PRESENT : NO BORD"
2001 A$=A$+"ER SCROLL !  PRESS A KEY TO"
2002 A$=A$+" EXIT!.....WRITE TO ME! MY "
2003 A$=A$+"ADRESS IS: PEDER NORRBY ← N"
2004 A$=A$+"ORENS V. 6 ← 75263 UPPSALA "
2005 A$=A$+"← SWEDEN ← HELLO TO C.C.I. "
2006 A$=A$+"STAFF !! AND MR. FRANKLIN  "
2009 TEXT=49664:REM START OF TEXT
2010 FOR A=1 TO LEN(A$)
2020 C=ASC(MID$(A$,A,1))
2030 POKE TEXT,C:TEXT=TEXT+1
2040 NEXT A:RETURN
```

CHANGER

by Jonathan Living

C-64

Changer will enable you to create two different shapes and then will gradually change the first one until it looks like the second. Each phase of the change is stored in memory and is then played back fast so as to produce a very impressive piece of animation.

From previous programs in CCI, you've probably guessed by now that I'm into graphics, and this program is no exception. It's called 'Changer' because that's exactly what it does . . . it changes one drawing into another in gradual steps. The effect is achieved by 3 routines — two machine code (low-res plot and memory copy routines) and one BASIC (the 'Changer' program).

Okay. First, the good news. Any line drawing can be 'changed' to another in up to thirty frames, to produce a very pleasing effect. The bad news? For that amount of frames to be stored we have to resort to simulated quarter-square plotting – a resolution of only 80 x 50.

Type in the BASIC loader for the machine code and save it first. Run the program and, providing there are no checksum errors, you will eventually be presented with a string of pokes. Pressing <RETURN> saves the code. Re-load the code with LOAD "CHANGER",D,1 (where 'D' is the device number . . . 1 for tape of 8 for disk). The following commands are available to you:—

SYS 49152,X,Y,C

Plots a point at (X,Y) with colour 'C'.'X' ranges from 0-79, 'Y' ranges from 0-49 and 'C' ranges from 0-15.

SYS 49418,SA,DA,NB

The obligatory memory copy routine. Copies memory from 'SA' (Source Address) to 'DA' (Destination Address) for 'NB' bytes.

The BASIC demonstration program, as it stands, changes a 'J' into an 'L' (My initials . . . I'm usually quite modest . . .). To understand how to get your own shapes changing, let's consider a simple change, like a square into a triangle.

The first DATA item (from line 290 onwards) is the number of co-ordinates needed to make up the most complex of the two shapes. In our case, it's the square, and there are in fact five pairs of co-ordinates since we nearly always draw a line back to the first point. The next few data items are the shapes' co-ordinates. E.g.:—

290 DATA 5,	:Number of co-ordinates.
300 DATA 10,10	:Top left of square.
10,40	:Bottom left of square.
40,40	:Bottom right of square.
40,10	:Top right of square.
10,10	:Back to Top left.

A-ha, I hear you cry, but a triangle only has four co-ordinates (three sides), so what do we do? To get round the problem, we put an imaginary co-ordinate somewhere in the shape. I've put it mid-way along the base of the triangle, so there are apparently only three sides, but there are in fact four. E.g.:—

310 DATA 50,40	:Mid-way 'hidden' corner.
70,40	:Bottom right of triangle.
50,10	:Top of triangle.
30,40	:Bottom left of triangle.
50,40	:Back to mid-way point.

When you run the program, you will be asked for the number of frames to be drawn, from one shape to the other. Less than about 8 and animation isn't that good. Thirty is the maximum number, and gives a very smooth change (no more, please, we don't want you writing into ROM, now do we?). Wait while the selected number of frames are drawn, and watch them be replayed at high speed to give the animated effect.

```
1 REM ********************
2 REM *                  *
3 REM *      CHANGER     *
4 REM *        BY        *
5 REM *     J. LIVING    *
6 REM *                  *
7 REM ********************
10 L= 49152
20 FOR X=0 TO  23 :T=0:FOR Y=0 TO 14
30 READ A:IF A <0 OR A >255 THEN 60
40 POKE L,A:L=L+1:T=T+A:NEXT
```

```
50 READ A:T=T-(INT(T/256)*256)
60 IF T<>A THEN PRINT"DATA ERROR IN LINE"1000+(X*10)"CHECKSUM <>"A:STOP
70 PRINT 1000+(X*10)"OK":NEXT
80 PRINT CHR$(147)
90 PRINT"MAKE SURE YOU'VE SAVED THIS PROGRAM !!!":PRINT
100 INPUT "(D)ISK OR (T)APE ";DE$
110 DS$="1":IF DE$="D" THEN DS$="8"
120 PRINT:PRINT:PRINT:PRINT:PRINT
130 PRINT "POKE 43,0:POKE 44,192:POKE 45,100:POKE 46,193";
140 PRINT ":SAVE "CHR$(34)"CHANGER"CHR$(34)","DS$;
150 FOR X=1 TO 4:PRINTCHR$(145);:NEXT:PRINT"PRESS <RETURN>"
1000 DATA 088,032,253,174,032,138,173,032,247,183,165,020,133,248,032,  158
1010 DATA 253,174,032,138,173,032,247,183,165,020,133,249,032,253,174,  210
1020 DATA 032,138,173,032,247,183,165,020,133,250,165,248,056,160,000,  210
1030 DATA 233,002,200,176,251,136,105,002,141,060,003,132,251,165,249,  058
1040 DATA 056,160,000,233,002,200,176,251,136,105,002,141,061,003,132,  122
1050 DATA 252,160,004,132,249,160,000,132,248,160,255,165,248,024,200,  085
1060 DATA 196,252,240,013,105,040,176,003,076,089,192,024,230,249,076,  169
1070 DATA 089,192,133,248,024,164,251,177,248,141,062,003,169,001,024,  134
1080 DATA 109,060,003,109,061,003,109,061,003,141,063,003,160,000,185,  046
1090 DATA 186,192,205,062,003,240,018,200,200,200,200,200,192,075,208,  077
1100 DATA 239,172,063,003,185,004,193,076,169,192,152,024,109,063,003,  111
1110 DATA 168,185,186,192,164,251,145,248,024,165,249,105,212,133,249,  116
1120 DATA 165,250,145,248,120,096,126,126,226,097,127,124,226,124,255,  151
1130 DATA 225,123,097,255,123,098,108,127,225,098,108,097,097,236,097,  066
1140 DATA 252,226,226,226,236,251,225,251,225,254,225,098,252,254,098,  227
1150 DATA 098,127,127,251,252,127,255,236,255,255,254,254,160,254,254,  087
1160 DATA 254,252,252,160,252,252,251,251,251,160,251,236,236,236,236,  202
1170 DATA 160,160,160,160,160,160,126,124,123,108,032,088,032,253,174,  228
1180 DATA 032,138,173,032,247,183,165,020,133,251,165,021,133,252,032,  185
1190 DATA 253,174,032,138,173,032,247,183,165,020,133,253,165,021,133,  074
1200 DATA 254,032,253,174,032,138,173,032,247,183,165,020,133,249,165,  202
1210 DATA 021,133,250,162,000,160,255,228,250,240,017,200,177,251,145,  185
1220 DATA 253,192,255,208,247,230,252,230,254,232,076,066,193,160,255,  031
1230 DATA 200,177,251,145,253,196,249,208,247,120,096,000,000,000,000,  094
```

```
1 REM *******************
2 REM *                 *
3 REM *   CHANGER DEMO  *
4 REM *       BY        *
5 REM *    J. LIVING    *
6 REM *                 *
7 REM *******************
10 POKE 53280,Q:POKE53281,0:PRINT CHR$(147)
20 INPUT "NUMBER OF FRAMES ";F
30 RESTORE:READ N
40 DIM X(N),Y(N),C(N),P(N),XI(N),YI(N)
50 FOR A=1 TO N:READ X(A),Y(A):NEXT A
60 FOR A=1 TO N:READ C(A),P(A):NEXT A
70 FOR A=1 TO N:XI(A)=(C(A)-X(A))/(F-1):YI(A)=(P(A)-Y(A))/(F-1):NEXT A
80 SA=10000
90 FOR G=1 TO F
100 PRINT CHR$(147)
110 FOR L=1 TO N-1
120 X1=X(L):Y1=Y(L):X2=X(L+1):Y2=Y(L+1):CL=1:GOSUB 330
130 NEXT L
140 SYS 49418,1024,SA,1000
150 SA=SA+1000
160 FOR U=1 TO N:X(U)=X(U)+XI(U):Y(U)=Y(U)+YI(U):NEXT U
170 NEXT G: PRINT CHR$(147)
180 FOR I=55296 TO 56295:POKEI,1:NEXT I
```

```
190 SA=10000
200 FOR G=1 TO F
210 SYS 49418,SA,1024,1000
220 SA=SA+1000
230 NEXT G
240 SA=9000+F*1000
250 FOR G=1 TO F
260 SYS 49418,SA,1024,1000
270 SA=SA-1000
280 NEXT G
290 GOTO 190
300 DATA 11
310 DATA 10,10,40,10,40,20,30,20,30,40,10,40,10,30,20,30,20,20,10,20,10,10
320 DATA 70,30,70,40,60,40,40,40,40,20,40,10,50,10,50,20,50,30,60,30,70,30
330 REM ********* LINE ROUTINE *********
340 X=X1:Y=Y1:Z=10E-10
350 IF ABS(X2-X1+Z)/ABS(Y2-Y1+Z)>=1THEN 400
360 FOR Y=Y1 TO Y2 STEP (Y2-Y1+Z)/ABS(Y2-Y1+Z)
370 X=X+(X2-X1+Z)/ABS(Y2-Y1+Z):SYS 49152,X,Y,CL
380 NEXT Y
390 RETURN
400 FOR X=X1 TO X2 STEP (X2-X1+Z)/ABS(X2-X1+Z)
410 Y=Y+(Y2-Y1+Z)/ABS(X2-X1+Z):SYS 49152,X,Y,CL
420 NEXT X
430 RETURN
```

SPRITE MANIPULATOR

by Steven Pattullo

C-64

Another machine code sprite program. This one will allow users to set up to eight sprites moving at once. Each sprite can move in a different direction and at a different speed. An ideal program to help BASIC programmers to add a professional touch to their work.

'SPRITE MANIPULATOR' for the Commodore 64 enable you to manipulate sprites all over the screen with great ease, you can also speed up and slow down the sprites.

The program runs under raster interrupt so this ensures that no flickering will occur on the sprites.

1. Type in, save and then run the main program.
2. Type in, save and then run the demo program.

How to use the Sprite Manipulator

To start the routine type SYS 49152 This will set up the interrupts, SM is now ready to use.

Each sprite requires two pokes one for speed and one for direction.

The directions are:—

1 = up
2 = up right
3 = right
4 = down right
5 = down
6 = down left
7 = left
8 = up left

To set these directions use the following formula:—

POKE 828+SN,DIRECTION
Where,
SN = The sprite number 0-7
DIRECTION = See table above.

To set the sprite speed use:

POKE 837+SN,SP
Where,
SN = The sprite number 0-7
SP = Speed (1-255, 1 is the slowest)

Poking a value of 0 into SP will stop the sprite.

I would recommend that you use a maximum speed of 8 because after this things get a bit too fast.

Anybody can use this utility in their own programs but I would be grateful for a small mention.

PROGRAM FOLLOWS..

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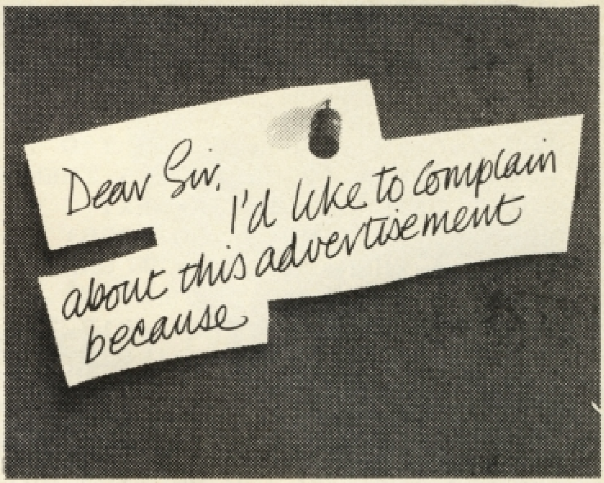

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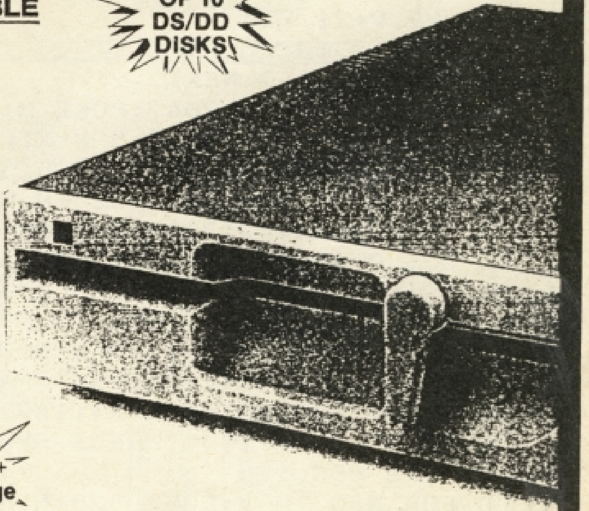

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```
10 L= 49152
20 FOR X=0 TO  24 :T=0:FOR Y=0 TO 14
30 READ A:IF A <0 OR A >255 THEN 60
40 POKE L,A:L=L+1:T=T+A:NEXT
50 READ A:T=T-(INT(T/256)*256)
60 IF T<>A THEN PRINT"DATA ERROR IN LINE"1000+(X*10)"CHECKSUM <>"A:STOP
70 PRINT 1000+(X*10)"OK":NEXT
1000 DATA 120,169,127,141,013,220,169,050,141,020,003,169,192,141,021,  160
1010 DATA 003,169,001,141,026,208,141,025,208,169,255,141,018,208,173,  094
1020 DATA 017,208,041,127,141,017,208,088,096,208,088,096,141,017,208,  165
1030 DATA 088,096,000,000,000,173,025,208,041,001,208,003,076,049,234,  178
1040 DATA 141,025,208,173,018,208,201,255,240,000,169,255,141,018,208,  212
1050 DATA 162,000,160,000,169,001,141,132,003,189,060,003,201,001,208,  150
1060 DATA 003,076,157,192,201,002,208,003,076,170,192,201,003,208,003,  159
1070 DATA 076,198,192,201,004,208,003,076,216,192,201,005,208,003,076,  067
1080 DATA 244,192,201,006,208,003,076,001,193,201,007,208,003,076,029,  112
1090 DATA 193,201,008,208,003,076,047,193,200,200,024,046,132,003,232,  230
1100 DATA 224,008,208,186,076,049,234,185,001,208,056,253,069,003,153,  121
1110 DATA 001,208,076,143,192,185,001,208,056,253,069,003,153,001,208,  221
1120 DATA 185,000,208,024,125,069,003,144,003,032,075,193,153,000,208,  142
1130 DATA 076,143,192,185,000,208,024,125,069,003,144,003,032,075,193,  192
1140 DATA 153,000,208,076,143,192,185,000,208,024,125,069,003,144,003,  253
1150 DATA 032,075,193,153,000,208,185,001,208,024,125,069,003,153,001,  150
1160 DATA 208,076,143,192,185,001,208,024,125,069,003,153,001,208,076,  136
1170 DATA 143,192,185,001,208,024,125,069,003,153,001,208,185,000,208,  169
1180 DATA 056,253,069,003,176,003,032,087,193,153,000,208,076,143,192,  108
1190 DATA 185,000,208,056,253,069,003,176,003,032,087,193,153,000,208,  090
1200 DATA 076,143,192,185,001,208,056,253,069,003,153,001,208,185,000,  197
1210 DATA 208,056,253,069,003,176,003,032,087,193,153,000,208,076,143,  124
1220 DATA 192,173,016,208,077,132,003,141,016,208,169,000,096,173,016,  084
1230 DATA 208,077,132,003,141,016,208,173,016,208,045,132,003,205,132,  163
1240 DATA 003,208,005,169,095,076,114,193,169,255,096,000,000,000,000,  103

10 POKE 53280,0:POKE 53281,0
20 SYS 49152
30 V=53248
40 POKE V+23,0:POKE V+29,0
50 FOR N=960 TO 960+62:POKE N,255:NEXT
60 POKE V+21,255
70 FOR N=0 TO 15
80 POKE V+N,150:NEXT
90 FOR N=2040 TO 2047:POKE N,15:NEXT
100 REM  SET SPEED TO 3 PIXELS
110 FOR N=837 TO 844:POKE N,3:NEXT
120 FOR N=0 TO 7:POKE 828+N,N+1:NEXT:PRINT CHR$(5)
130 PRINT CHR$(147)"PRESS SPACE TO STOP SPRITES"
140 GOSUB 430:FOR N=837 TO 844:POKE N,0:NEXT
150 PRINT CHR$(147)"PRESS SPACE TO MOVE ALL SPRITES RIGHT"
160 GOSUB 430:FOR N=828 TO 835:POKE N,3:NEXT
170 FOR N=837 TO 844:POKE N,3:NEXT
180 PRINT CHR$(147)"PRESS SPACE FOR SPEED DEMO"
190 GOSUB 430:PRINT CHR$(147)"USE + AND - TO CHANGE SPEED"
200 PRINT CHR$(159)"PRESS SPACE FOR SQUARE DEMO"
210 POKE 650,128
220 FOR N=0 TO 7:POKE 828+N,N+1:NEXT:PRINT:PRINT:PRINT
230 Z=3
240 GET A$
250 PRINT CHR$(145)"
260 PRINT CHR$(145)"SPEED=";Z
270 FOR N=837 TO 844:POKE N,Z:NEXT
280 IF A$="+" AND Z<255 THEN Z=Z+1
```

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```
290 IF A$="-" AND Z>0 THEN Z=Z-1
300 IF A$=" " THEN 320
310 GOTO 240
320 POKE V+21,1:POKE 837,5
330 POKE V+1,170:POKE V,255:POKE V+23,1:POKE V+29,1:POKE V+16,0
340 PRINT CHR$(147)"PRESS SPACE"
350 Z=0:POKE 828,3
360 Z=Z+1
370 IF Z=10 THEN POKE 828,1
380 IF Z=20 THEN POKE 828,7
390 IF Z=30 THEN POKE 828,5
400 IF Z=40 THEN POKE 828,3:Z=0
410 GOSUB 430:RUN
420 GOTO 360
430 GET A$:IF A$=""THEN 430
440 RETURN
```

ULTRIX

by Jonathan Living

C-64

Jonathan Living again! This time with a Space invaders style arcade game but with the addition of a few cryptic comments. The rules are simple and yet the game is difficult enough for it to be a challenge.

Ultrix is an arcade shoot 'em up style program, written in about 2K of pure machine code, although there is an overhead of about 900 or so bytes for sprite data, etc.

Game play takes place within a confined space and both your base and the aliens move in it. The aliens bounce independently around, while you can move your base along the bottom of the screen. A collision with an alien costs you a life. Your base has automatic rapid fire, and as you hit each alien , they change colour until finally they turn black and are wiped off. Clearly their staring colours are significant here, as aliens which start off red, for example, will require two diréct hits to be destroyed, while aliens which are, let's say orange in colour, will require 8 hits. There are 5 levels of lovely graphics and rather nasty comments on some levels. The game becomes suicidally fast with scores of about 16,000 and more.

Type in the program and run it. When the routine has reached the point of asking 'Disk or tape?', I recommend run stop/restoring the program and saving it as 'working loader' or something like that. Remember, the program is destroyed for the machine code save if you don't stop it at this point. Input 'D' or 'T' for the device you are using. You will then be presented with a string of pokes, with the cursor positioned at the beginning. Press (RETURN) to save the code. Reload the code with LOAD "ULTRIX",d,1 (where d = 1 for tape or 8 for disk). Type 'NEW' and sys 49152 to start the game.

You should also be aware that running the machine code program transfers sprite data to the 15680 to 16383 memory region, since this is the highest possible location for sprites in standard machine configuration. Obviously any BASIC program in memory longer than about 13K is corrupted and with the basic loader in memory, I don't recommend calling the machine code before you save the basic loader, since it is about 15K in length, and will be irreversibly corrupted towards the end.

I thought I'd be generous and give you a few pokes!

1. POKE 49555,LIVES+46.
   E.g.: A poke of 248 gives you 200 lives. Anything over 9 and the 'lives' screen display looks strange, because only one digit is used for life storage.
2. POKE 49176,A:POKE 50618,B.
   E.g.: Default of A = 20 and B = 100, which gives a total delay time of 20★100 = 2000. The game speeds up to a maximum over 'A' levels, with the time delay decreasing with 'B' each level. So if A = 8 and B = 250 then the starting speed will remain the same, while the game will increase to a maximum in speed over eight levels.

```
10 L= 49152
20 FOR X=0 TO  145 :T=0:FOR Y=0 TO 14
30 READ A:IF A <0 OR A >255 THEN 60
40 POKE L,A:L=L+1:T=T+A:NEXT
50 READ A:T=T-(INT(T/256)*256)
60 IF T<>A THEN PRINT"DATA ERROR IN LINE"1000+(X*10)"CHECKSUM <>"A:STOP
70 PRINT 1000+(X*10)"OK":NEXT:PRINT
80 GOSUB 3000
90 PRINT "STOP THE PROGRAM AND SAVE IT IF YOU     HAVEN'T ALREADY !"
100 PRINT:INPUT "(D)ISK OR (T)APE ";DE$
110 S$="1":IF DE$="D" THEN S$="8":PRINT:PRINT:PRINT:PRINT
120 PRINT "POKE43,0:POKE44,192:POKE45,0:POKE46,208:SAVE";CHR$(34);
130 PRINT "ULTRIX";CHR$(34);",";S$
140 FOR X=1 TO 4:PRINT CHR$(145);:NEXT:END
1000 DATA 169,048,160,000,153,208,207,200,192,006,208,248.169,000,141, 061
1010 DATA 032,208,141,033,208,076,235,198,162,020,142,236,207,160,000, 010
1020 DATA 185,032,203,153,064,061,185,031,204.153,063,062,135,030,205, 024
1030 DATA 153,062,063,200,192,255,208,233,160,000,169,032,153,000,004, 092
1040 DATA 153,250,004,153,244,005,153,238,006,200,192.250,208,239,160, 151
1050 DATA 000,169,066,153,080,004,153,104,005,153,128,006,153,168,006, 068
1060 DATA 153,111,004,153,135,005,153,159,006,153,199,006,153,112.004, 226
1070 DATA 153,136,005,153,160,006,153,200,006,153,119,004,153,143,005, 013
1080 DATA 153,167,006,153,207,006,024,152,105,040,168,192,024,208,197, 010
1090 DATA 169,112,141,040,004,141,072,004,169,110,141,071,004,141,079, 118
1100 DATA 004,141,148,007,169,109,141,192,007,141,224,007,141,188,007, 090
1110 DATA 169,125,141,223,007,141,231,007,141,186,007,169,114,141,146, 156
1120 DATA 007,169,064,141,145,007,141,147,007,141,139,007,141,185,007, 218
1130 DATA 160,000,153,041,004,153,193,007,200,192,030,208,245,160,000, 210
1140 DATA 153,073,004,153,225,007,200,192,006,208,245,160,000,162,000, 252
1150 DATA 224,000,208,002,169,002,224,032,208,002,169,001,224,039,208, 176
1160 DATA 002,162,255,153,040,216,153,240,216,153,184,217,153,128,218, 186
1170 DATA 153,032,219,232,200,192,200,208,217,169,046,141,187,007,141, 040
1180 DATA 190,007,169,021,141,113,004,169,012,141,114,004,141,161,006, 113
1190 DATA 169,020,141,115,004,169,018,141,116,004,141,236,004,141,220, 103
1200 DATA 005,169,009,141,117,004,141,178,005,141,162,006,169,024,141, 132
1210 DATA 118,004,169,019,141,233,004,141,217,005,141,165,006,169,003, 255
1220 DATA 141,234,004,141,218,005,169,015,141,235,004,141,219,005,169, 049
1230 DATA 005,141,237,004,141,221,005,141,164,006,169,008,141,177,005, 029
1240 DATA 169,022,141,163,006,169,002,141,105,007,169,025,141,106,007, 093
1250 DATA 169,048,160,000,153,057,005,153,241,006,200,192,006,208,245, 051
1260 DATA 169,007,160,000,153,000,216,200,192,040,208,248,169,057,141, 168
1270 DATA 246,006,160,000,185,208,207,153,041,006,200,192,006,208,245, 015
1280 DATA 169,000,141,214,207,141,215,207,141,216,207,141,217,207,169, 032
1290 DATA 255,141,248,007,169,245,141,249,007,141,250,007,141,251,007, 211
1300 DATA 169,250,141,252,007,141,253,007,141,254,007,141,255,007,172, 149
1310 DATA 214,207,162,000,185,224,205,157,000,004,200,232,140,214,207, 047
1320 DATA 224,040,208,241,172,215,207,162,000,185,052,207,157,040,208, 014
1330 DATA 200,232,140,215,207,224,007,208,241,172,216,207,162,000,185, 056
1340 DATA 238,206,157,002,208,200,232,140,216,207,224,014,208,241,172, 105
1350 DATA 217,207,162,000,185,168,206,157,218,207,200,232,140,217,207, 163
1360 DATA 224,014,208,241,169,224,141,001,208,169,140,141,000,208,169, 209
1370 DATA 000,141,232,207,169,005,141,039,208,169,255,141,021,208,173, 061
1380 DATA 030,208,201,000,208,249,173,031,208,201,000,208,242,173,000, 084
1390 DATA 220,041,004,201,004,240,014,174,000,208,224,030,240,027,202, 037
1400 DATA 142,000,208,076,114,194,173,000,220,041,008,201,008,240,011, 100
1410 DATA 174,000,208,224,250,240,004,232,142,000,208,173,000,220,041, 068
1420 DATA 016,201,016,240,032,173,232,207,201,000,208,025,162,001,142, 064
1430 DATA 232,207,162,065,142,237,207,162,015,142,024,212,162,009,142, 072
1440 DATA 005,212,162,000,142,006,212,160,000,185,002,208,201,251,208, 162
1450 DATA 008,169,000,153,218,207,076,184,194,185,002,208,201,029,208, 250
1460 DATA 005,169,001,153,218,207,185,218,207.201,001,208,012,185,002, 180
```

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1470 DATA 208,024,105,001,153,002,208,076,212,194,185,002,208,056,233,  075
1480 DATA 001,153,002,208,200,200,192,014,208,195,160,000,185,003,208,  137
1490 DATA 201,224,208,008,169,000,153,219,207,076,247,194,185,003,208,  254
1500 DATA 201,063,208,005,169,001,153,219,207,185,219,207,201,001,208,  199
1510 DATA 012,185,003,208,024,105,001,153,003,208,076,019,195,185,003,  100
1520 DATA 208,056,233,001,153,003,208,200,200,192,014,208,195,173,232,  228
1530 DATA 207,201,001,208,036,169,007,133,252,169,072,133,251,169,000,  216
1540 DATA 141,234,207,162,000,173,000,208,056,233,004,233,008,232,176,  019
1550 DATA 251,202,202,142,233,207,162,002,142,232,207,174,232,207,224,  003
1560 DATA 002,208,109,162,032,142,004,212,174,237,207,142,001,212,202,  254
1570 DATA 142,237,207,162,000,142,000,212,162,033,142,004,212,169,034,  066
1580 DATA 172,233,207,145,251,152,024,105,040,168,169,032,145,251,165,  211
1590 DATA 251,133,253,165,252,024,105,212,133,254,169,001,172,233,207,  004
1600 DATA 145,253,174,234,207,232,142,234,207,224,019,208,003,032,162,  172
1610 DATA 195,165,251,056,233,040,133,251,176,002,198,252,076,184,195,  103
1620 DATA 169,032,172,233,207,145,251,152,024,105,040,168,169,032,145,  252
1630 DATA 251,169,000,141,232,207,096,173,031,208,141,235,207,024,173,  240
1640 DATA 235,207,041,002,201,002,208,039,032,162,195,169,255,237,040,  233
1650 DATA 208,105,010,168,032,198,197,172,040,208,136,192,240,208,011,  077
1660 DATA 173,021,208,041,253,141,021,208,076,021,197,140,040,208,076,  032
1670 DATA 021,197,024,173,235,207,041,004,201,004,208,039,032,162,195,  207
1680 DATA 169,255,237,041,208,105,010,168,032,198,197,172,041,208,136,  129
1690 DATA 192,240,208,011,173,021,208,041,251,141,021,208,076,021,197,  217
1700 DATA 140,041,208,076,021,197,024,173,235,207,041,008,201,008,208,  252
1710 DATA 039,032,162,195,169,255,237,042,208,105,010,168,032,198,197,  001
1720 DATA 172,042,208,136,192,240,208,011,173,021,208,041,247,141,021,  013
1730 DATA 208,076,021,197,140,042,208,076,021,197,024,173,235,207,041,  074
1740 DATA 016,201,016,208,039,032,162,195,169,255,237,043,208,105,010,  104
1750 DATA 168,032,198,197,172,043,208,136,192,240,208,011,173,021,208,  159
1760 DATA 041,239,141,021,208,076,021,197,140,043,208,076,021,197,024,  117
1770 DATA 173,235,207,041,032,201,032,208,039,032,162,195,169,255,237,  170
1780 DATA 044,208,105,010,168,032,198,197,172,044,208,136,192,240,208,  114
1790 DATA 011,173,021,208,041,223,141,021,208,076,021,197,140,044,208,  197
1800 DATA 076,021,197,024,173,235,207,041,064,201,064,208,039,032,162,  208
1810 DATA 195,169,255,237,045,208,105,010,168,032,198,197,172,045,208,  196
1820 DATA 136,192,240,208,011,173,021,208,041,191,141,021,208,076,021,  096
1830 DATA 197,140,045,208,076,021,197,024,173,235,207,041,128,201,128,  229
1840 DATA 208,039,032,162,195,169,255,237,046,208,105,010,168,032,198,  016
1850 DATA 197,172,046,208,136,192,240,208,011,173,021,208,041,127,141,  073
1860 DATA 021,208,076,021,197,140,046,208,076,021,197,173,021,208,201,  022
1870 DATA 001,208,049,174,236,207,224,001,240,003,206,236,207,174,249,  111
1880 DATA 007,224,249,208,003,076,164,193,238,255,007,238,249,007,238,  052
1890 DATA 250,007,238,251,007,238,252,007,238,253,007,238,254,007,169,  112
1900 DATA 255,141,021,208,076,208,193,173,030,208,024,041,001,201,001,  245
1910 DATA 208,093,032,162,195,160,000,162,000,142,039,208,232,224,000,  065
1920 DATA 208,248,200,192,255,208,241,173,021,208,041,254,141,021,208,  059
1930 DATA 032,078,200,174,246,006,224,048,208,003,076,066,198,202,142,  111
1940 DATA 246,006,056,173,214,207,056,233,040,141,214,207,173,215,207,  084
1950 DATA 056,233,007,141,215,207,173,216,207,056,233,014,141,216,207,  018
1960 DATA 173,217,207,056,233,014,141,217,207,169,255,141,021,208,173,  128
1970 DATA 030,208,076,208,193,162,000,160,000,200,192,100,208,251,232,  172
1980 DATA 236,236,207,208,243,076,071,194,174,062,005,224,057,208,075,  228
1990 DATA 162,048,142,062,005,174,061,005,224,057,208,069,162,048,142,  033
2000 DATA 061,005,174,060,005,224,057,208,063,162,048,142,060,005,174,  168
2010 DATA 059,005,224,057,208,057,162,048,142,059,005,174,058,005,224,  207
2020 DATA 057,208,051,162,048,142,058,005,174,057,005,224,057,208,045,  221
2030 DATA 169,048,162,000,157,057,005,232,224,006,208,248,076,060,198,  058
2040 DATA 238,062,005,076,060,198,238,061,005,076,060,198,238,060,005,  044
2050 DATA 076,060,198,238,059,005,076,060,198,238,058,005,076,060,198,  069
2060 DATA 238,057,005,076,060,198,136,192,000,208,133,096,160,000,185,  208
2070 DATA 208,207,217,057,005,208,008,200,192,006,208,243,076,093,198,  078
2080 DATA 185,208,207,056,249,057,005,144,003,076,109,198,160,000,185,  050
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2090 DATA 057,005,153,208,207,200,192,006,208,245,169,000,032,093,200,  183
2100 DATA 169,007,141,235,005,169,001,141,236,005,169,013,141,237,005,  138
2110 DATA 169,005,141,238,005,141,243,005,169,015,141,241,005,169,022,  173
2120 DATA 141,242,005,169,018,141,244,005,169,000,141,021,208,032,078,  078
2130 DATA 200,032,078,200,169,011,032,093,200,032,078,200,169,012,032,  002
2140 DATA 093,200,032,078,200,169,015,032,093,200,032,078,200,169,001,  056
2150 DATA 032,093,200,032,078,200,169,001,032,104,200,032,078,200,169,  084
2160 DATA 015,032,104,200,032,078,200,169,012,032,104,200,032,078,200,  208
2170 DATA 169,011,032,104,200,032,078,200,169,000,032,104,200,032,078,  161
2180 DATA 200,160,000,169,000,153,000,216,153,200,216,153,144,217,153,  086
2190 DATA 088,218,153,032,219,200,192,200,208,236,160,000,169,160,153,  084
2200 DATA 000,004,153,200,004,153,144,005,153,088,006,153,032,007,200,  022
2210 DATA 192,200,208,236,160,000,169,032,153,082,004,153,086,004,153,  040
2220 DATA 088,004,153,136,004,153,140,004,153,148,004,152,024,105,040,  028
2230 DATA 168,192,240,208,227,160,000,169,032,153,067,005,153,072,005,  059
2240 DATA 153,074,005,153,094,004,153,096,004,153,100,004,153,101,004,  227
2250 DATA 153,221,004,153,106,004,153,108,004,153,090,005,153,092,005,  124
2260 DATA 200,192,003,208,215,160,000,169,032,153,144,004,153,112,004,  213
2270 DATA 153,116,004,153,056,005,153,060,005,152,024,105,040,168,192,  106
2280 DATA 080,208,230,160,000,169,032,153,006,005,153,152,004,153,234,  203
2290 DATA 004,152,024,105,041,168,192,123,208,236,169,032,141,195,004,  002
2300 DATA 141,017,005,169,032,160,000,153,002,004,153,146,005,200,192,  099
2310 DATA 035,208,245,169,131,141,055,006,169,143,141,056,006,141,066,  176
2320 DATA 006,169,144,141,057,006,141,006,007,169,153,141,058,006,169,  093
2330 DATA 146,141,059,006,141,007,007,141,015,007,169,137,141,060,006,  159
2340 DATA 141,075,006,141,077,006,141,014,007,169,135,141,061,006,141,  237
2350 DATA 079,006,169,136,141,062,006,141,070,006,169,148,141,063,006,  063
2360 DATA 141,069,006,169,138,141,065,006,169,142,141,067,006,141,072,  193
2370 DATA 006,141,078,006,169,129,141,068,006,141,071,006,169,140,141,  132
2380 DATA 074,006,169,150,141,076,006,169,133,141,008,007,141,016,007,  220
2390 DATA 169,147,141,009,007,141,010,007,169,134,141,013,007,032,078,  181
2400 DATA 200,162,000,142,033,208,232,173,000,220,024,041,016,201,016,  132
2410 DATA 240,242,169,000,141,033,208,076,023,192,096,160,000,162,000,  206
2420 DATA 232,224,000,208,251,200,192,255,208,244,096,160,000,153,235,  098
2430 DATA 217,200,192,010,208,248,096,160,000,153,000,216,153,200,216,  221
2440 DATA 153,144,217,153,088,218,153,032,219,200,192,200,208,236,096,  205
2450 DATA 208,000,000,000,000,000,000,000,000,000,000,000,000,000,000,  208
3000 REM ******** SPRITE DATA *********
3010 L= 52000
3020 FOR X=0 TO  46 :T=0:FOR Y=0 TO 14
3030 READ A:IF A <0 OR A >255 THEN 3060
3040 POKE L,A:L=L+1:T=T+A:NEXT
3050 READ A:T=T-(INT(T/256)*256)
3060 IF T<>A THEN PRINT"DATA ERROR IN LINE"4000+(X*10)"CHECKSUM <>"A:STOP
3070 PRINT 4000+(X*10)"OK":NEXT
4000 DATA 000,000,000,000,060,000,000,255,000,001,255,128,001,227,128,  031
4010 DATA 003,033,192,003,034,192,098,068,070,246,072,111,247,080,111,  024
4020 DATA 247,231,239,247,248,239,247,240,239,247,255,239,247,255,239,  075
4030 DATA 247,255,239,246,126,111,246,126,111,247,255,239,247,255,239,  117
4040 DATA 247,255,239,000,007,255,224,015,255.240,031,255,248,031,000,  254
4050 DATA 248,030,000,120,030,000,120,030,128,120,030,192,120,030,096,  014
4060 DATA 120,031,000,248,031,255,248,031,255,248,030,126,120,030,126,  107
4070 DATA 120,031,255,248,031,255,248,031,255,248,031,255,248,028,000,  236
4080 DATA 056,024,000,024,024,000,024,000,001,255,000,011,255,128,055,  089
4090 DATA 255,216,079,255,231,159,111,241,064,240,241,159,255,146,097,  189
4100 DATA 240,244,063,127,252,082,244,246,125,223,178,157,216,114,237,  188
4110 DATA 159,246,255,254,028,248,125,232,228,063,240,227,223,240,112,  064
4120 DATA 057,240,120,060,240,063,255,096,015,255,128,000,000,001,008,  002
4130 DATA 008,003,156,028,003,254,073,003,031,235,155,255,073,029,135,  161
4140 DATA 073,031,182,073,031,134,073,007,254,127,012.030,008,015,238,  008
4150 DATA 028,003,236,063,255,254,063,255,255,028,003,255,008,031,255,  200
4160 DATA 009,158,031,011,220,060,009,248,120,008,248,124,008,248,127,  093
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PRICE lists are boring — try this mail order firms service — price tape £0.60, price disk £1.20 A&K Software, 105 Tintagel House, Salisbury Road, Edmonton, London N9.

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C64 owner wishes to swap games and news, disk only, send disks or list to: Alex Flekshteyn, 3041 Brighton 5 Street. Apt. 3G, Brooklyn, N.Y. 11235 USA.

CBM 64, C2N cassette, 1541 disk Drive, MPS803 printer, 1701 colour monitor, Neos Mouse, Artist disk, disk box and software. Sell for £475 ono or split. Tel Rainford (074 488) 2489 after 6pm.

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C64 owner wishes to swap games all over the world (disk only) all letters answered, send to: James Flowers (super-mutant) 93 Evershot Road, London N4 3DF, England.

CBM 64 games for sale, most under half price. Uridium £4.99, World games £4.99, loads more ring 0983 293730 after 5pm and ask for Andrew.

CBM 64 and disk drive, 100's of games on disk, two cartridge data recorder joystick £300. Tel: 01 475 1295 ask for Ian, ideal Xmas gift.

Amiga owner/programmer wishes to contact other Amiga owners for software and programming help. Write to Paul at 129 Fold Croft, Harlow, Essex CM20 1SJ.

Commodore 64 cassette 1541 disk drive and MPS 802 printer £320 ono will consider splitting. Ring 578143.

C64 128 Amiga penpals wanted all over the world. All letters answered send your lists to: Muhammad Suleman, 352 Tariq Block, Garden Town, Lahore, Pakistan.

CBM 128, Brand new 1541C disk drive, tape deck, tons of original software, freeze machine, joysticks, mint condition, £360 the lot ono. Ring 01-570 7789 after 7pm.

Vic 20 games for sale. £1 each. Also 16K switch-able ram pack £10, for list send sae to Christopher Mungall, 33 Kilnburn, Newpoit Scotland DD6 8DE.

Primary School wishes to exchange educ software with other schools or would buy. Also interested in Robotics. Send list or disk to Edel Quinn School, 31 Sandymount Ave, Dublin, Ireland.

C128 1571 double sided disk drive many cartridges and joysticks, over £100 worth of software very good condition, £400 ono. Phone 051 920 0949.

C128, 1571 drive, C2n, freeze frame, quickshot 2 + 2, Stack lightpen great disk, tape software, books, 10 3M disks unused, lockable disk box all in immaculate condition with original boxes £400 ono. Tel: 0895 56273.

C64 and brand new MP0801 printer with paper for sale, including games and Mini Office business software will split items. Phone Simon on 0322 22268.

Amiga owner wishes to swap software, many new titles write to: Timo Jarvenpaa, Rajaharjunt 12, 40800 Vaajakoski, FINLAND.

For sale 1551 disk drive plus disk and manual, boxed £70 ono. Tel: 0582 866174 (Dunstable).

Amiga fanatics drop me a line. I have a good collection of games let's swap hints etc. Speedy reply. Mark Blayney, 3TU RAAF Base, Pearce 6084 Western Australia.

Plus 4, tape deck, 2 joysticks, 66 games including Ace, Ghosts and Goblins and FB's Boxing all for £100. Tel: 05436 74325.

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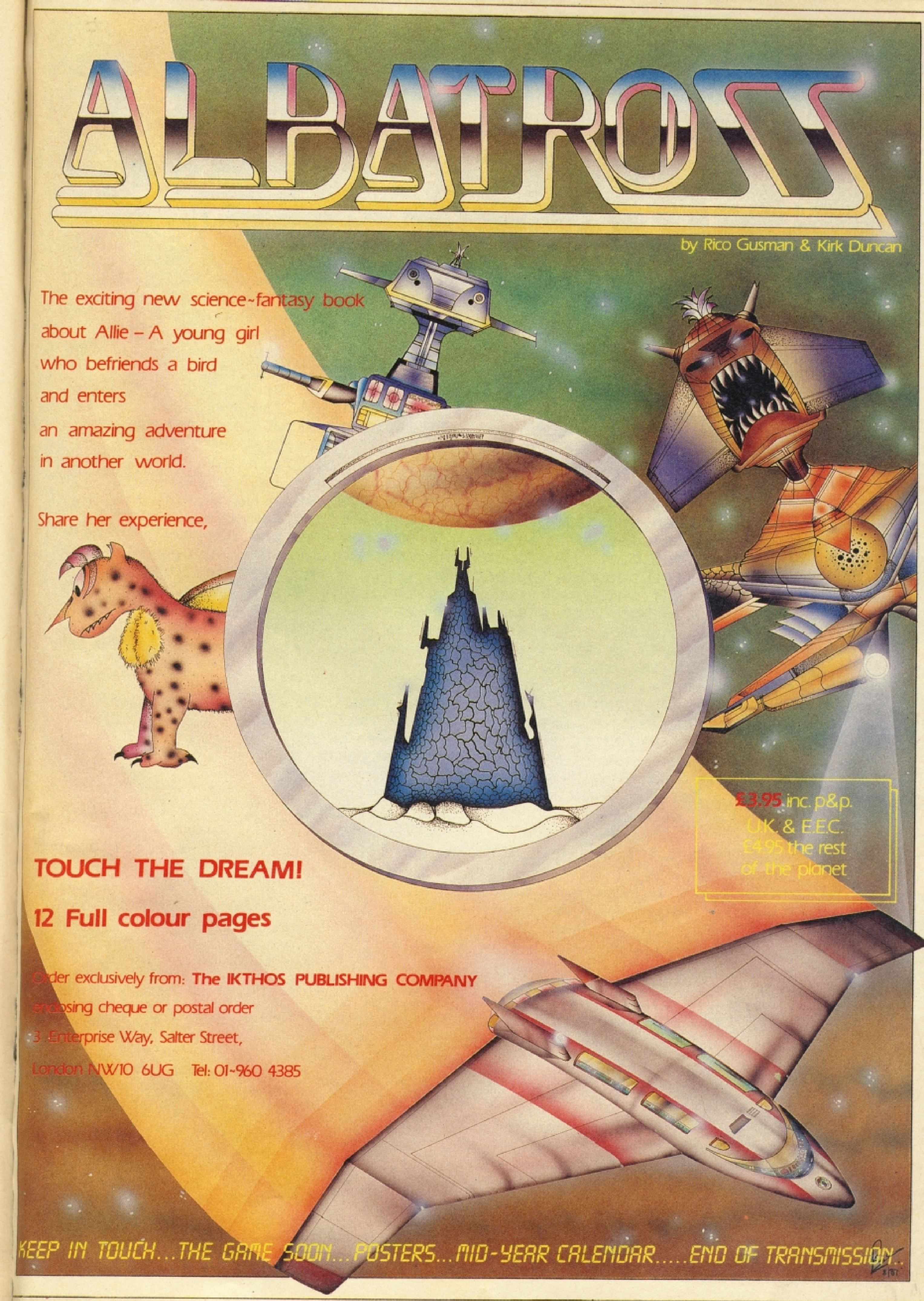

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4170 DATA 000,000,124,000,000,130,000,001,001,000,002,000,128,007,131,  012
4180 DATA 192,007,001,192,006,108.192,004,000,064,013,255,096,023,085.  214
4190 DATA 208,020,068,208,023,017,208,013,255,096,004,000,064,002,108,  014
4200 DATA 128,003,131,128,001,187,000,001,135,000,000,190,000,000,124,  004
4210 DATA 000,000,056,000,000,000,000,000,000,000,000,000,000,000,255,  055
4220 DATA 231,255,255,231,255,199,231,227,192,231,003,192,231,003,192,  112
4230 DATA 102,003,192,102,003,192,102,003,192,102,003,192,102,003,192,  205
4240 DATA 231,003,192,231,003,199,231,227,255,231,255,255,231,255,000.  239
4250 DATA 000,000,000,000,000,000,000,000,000,099,255,198,247,126,239,  140
4260 DATA 254,255,127,125,255,190,015,060,240,030,024,120,062,219,124,  052
4270 DATA 127,000,254,254,000,127,252,060,063,252,126,063,254,060,127,  227
4280 DATA 127,000,254,255,255,255,207,000,243,126,000,126,062,000,124.  242
4290 DATA 099,000,198,192,129,131,193,195,131,227,255,199,000,057,243,  201
4300 DATA 142,041,004,211,073,229,085,120,021.085,136,022,089,137,227.  086
4310 DATA 142,000,000,000,255,255,255,255,255,255,255,255,255,170,170,  217
4320 DATA 171,255,255,255,255,255,255,146,073,039,255,255,255,201,036,  145
4330 DATA 147,255,255,255,228,146,073,255,255,255,255,000,255,127,255.  200
4340 DATA 254,000,017,255,224,191,254,112,247,254,124,239,255,254,223.  087
4350 DATA 255,254,127,255,234,255,251,234,255,247,254,255,247,255,255,  049
4360 DATA 238,015,255,190,000,255,188,006,255,056,014,255,048,028,255,  010
4370 DATA 128,060,255,224,254,255,255,255,127,255,243,127,255,225,063,  165
4380 DATA 255,192,031,255,128,000,063,195,255,127,195,255,224,003,000,  130
4390 DATA 192,059,254,224,000,003,127,195,255,063,195,254,000,000,000,  029
4400 DATA 000,007,255,000,127,230,001,255,216,135,255,188,158,127,188,  094
4410 DATA 121,158,024,119,232,000,055,224,000,047,240,000,031,240,000,  211
4420 DATA 023,224,000,023,224,000,001,128,000,000,000,102,000,000,102,  059
4430 DATA 000,000,102,000,000,102,000,000,102,000,000,231,000,000,231.  000
4440 DATA 000,128,231,001,128,231,001,129,231,129,129,255,129,193,255,  122
4450 DATA 131,195,255,195,227,255,199,243,255,207,255,255,255,255,255,  109
4460 DATA 255,255,255,255,231,255,231,195,255,195,129,255,129,000,000,  079
4470 FOR T=0 TO 4:READ S$:FOR I=0 TO 39:J$=MID$(S$,I+1,1):A=ASC(J$):B=A
4480 IF A>=64 AND A<=95 THEN B=A-64
4490 POKE 52704+T*40+I,B:NEXTI,T
4500 DATA "DOES THE WALTON'S RADIO HAVE DOLBY NR. ?"
4510 DATA "FOR GREAT TV, FOLLOW THE BAIRD !!!!!!!!"
4520 DATA "LOOKS LIKE YOU'VE LOST AGAIN, JACK ....."
4530 DATA "DD-DOLPHIN DOS/DISK DEMON? TUT TUT DATEL"
4540 DATA "CLIVE'S HALUCINATING - HE CAN C5 NOT 4 !"
5000 FOR T=0 TO 69:READ A:POKE T+52904,A:NEXT T
5010 DATA 1,0,0,1,0,0,1,1,0,1,1,1,0,0,0,0,1,0,1,1,0,0,0,1,0,0,1,0,0,1,1,0,
     0,1,0
5020 DATA 0,1,0,0,0,1,1,0,0,1,0,1,0,0,0,0,1,1,0,1,0,1,1,0,0,0,1,1,1,0,0,
     0,1,1
5030 FOR T=0 TO 69:READ A:POKE T+52974,A:NEXT T
5040 DATA 030,070,060,100,090,130,120,160,150,130,180,100,210,070
5050 DATA 030,190,060,150,090,110,120,070,150,110,180,150,210,190
5060 DATA 030,070,060,095,090,120,120,145,150,170,180,195,210,220
5070 DATA 030,220,060,195,090,170,120,145,150,120,180,095,210,070
5080 DATA 030,120,060,170,090,120,120,070,150,120,180,170,210,120
5090 DATA 9,9,9,1,1,1,1
5100 DATA 9,9,9,7,7,7,7
5110 DATA 5,5,5,15,15,15,15
5120 DATA 2,2,2,14,14,14,14
5130 DATA 6,6,6,8,8,8,8
5140 FOR T=0 TO 34:READ A:POKE T+53044,A:NEXT
5150 RETURN
```

```
012
214
014
004
055
112
205
239
140
052
227
242
201
086
217
145
200
087
049
010
165
130
029
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211
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,0,
,0,
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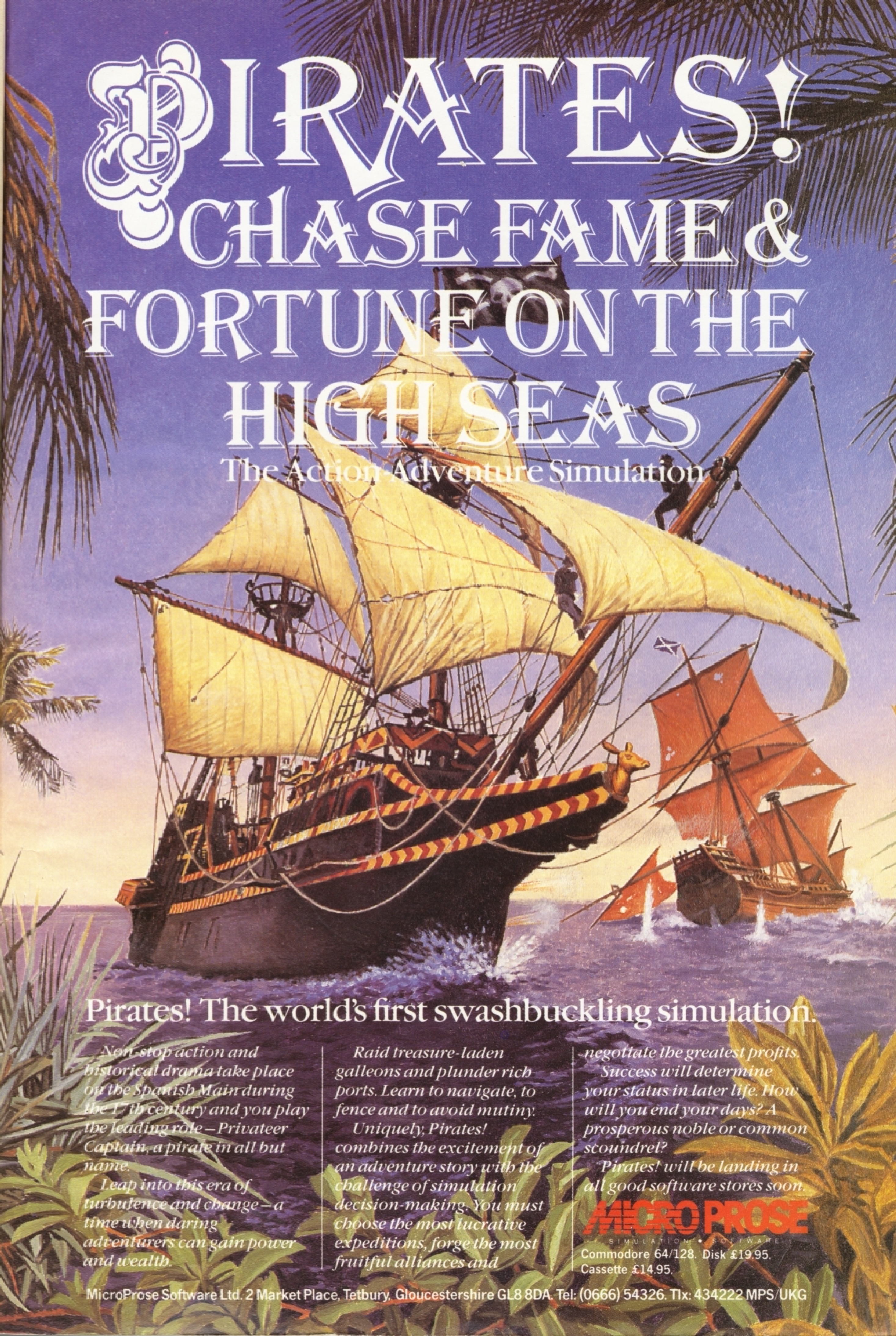
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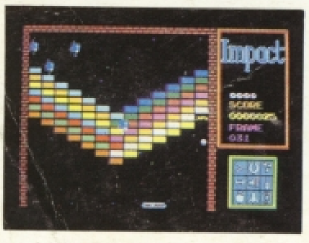
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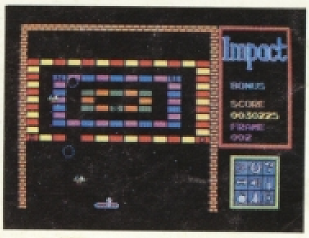
031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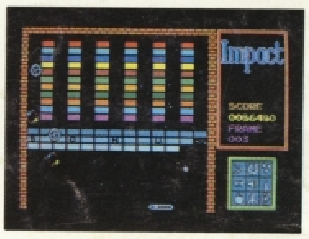
BONUS
SCORE
0030225
FRAME
002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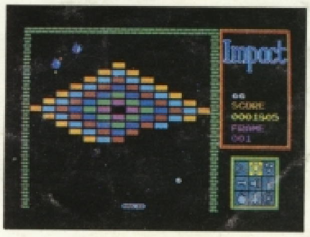
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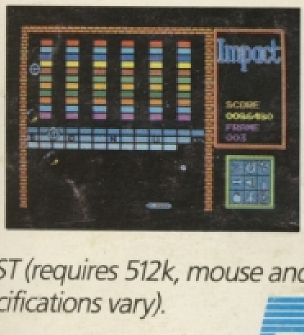
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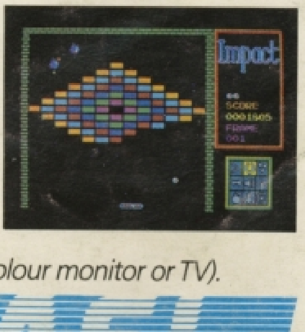
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